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A street in the city of Tokyo (formerly Yeddo). — Old and new are strongly contrasted. Mingled together are, on the one hand, electric railways, telephone and telegraph wires, modern buildings, people in modern Western dress, and, on the other hand, Oriental dress, architecture, and modes of transportation.

VOL.

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VOLUME TEN

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TRIMORPHISM, in biology, the existence in certain plants and animals of three distinct forms, especially in connection with the reproductive organs. In trimorphic plants there are three forms, differing in the lengths of their pistils and stamens, in size and color of their pollen grains, and in some other respects; and, as in each of the three forms there are two sets of stamens, the three forms possess altogether six sets of stamens and three kinds of pistils. These organs are so proportioned in length to each other that half the stamens in two of the forms stand on a level with the stigma of the third form. To obtain full fertility with these plants, it is necessary that the stigma of the one should be fertilized by pollen taken from the stamens of corresponding height in another form. Hence six unions are legitimate, *i. e.*, fully fertile, and 12 are illegitimate, or more or less unfertile. Wallace has shown that the females of certain butterflies from the Malay Archipelago appear in three conspicuously distinct forms without intermediate links. In crystallography, the occurrence of certain forms in minerals which have the same chemical composition, but are referable to three systems of crystallization.

TRIMURTI, in comparative religion. the later Hindu triad=Brahma, Vishnu, and Siva—considered as an inseparable unity. The Padma Purana, which, as a Purana of the Vaishnavas, assigns to Vishnu the highest rank, thus defines the Trimurti; "In the beginning of creation the great Vishnu, desirous of creating the world, produced from the right side of his body himself as Brahma; then, in order to preserve the world, he produced from the left side of his body Vishnu; and in order to destroy the world, he produced from the middle of his body the eternal Siva. Some worship Brahma, others Vishnu; one, yet threefold, creates, preserves, and destroys; therefore let the pious make no difference between the three." Trimurti, therefore, implies the unity of the three principles of creation, preservation, and destruction, and is an expression of philosophical, rather than of popular belief. The symbol of the Trimurti is the mystical syllable *o* (=*a*+*u*) *m;* where *a* stands for Brahma, *u* for Vishnu, and *m* for Siva. Also a representation of the Hindu triad. It consists of one human body with three heads, that of Brahma in the middle, that of Vishnu at the right, and that of Siva at the left.

TRINCOMALEE, a seaport. naval station, and harbor on the N. E. coast of Ceylon; 110 miles N. E. of Kandy. The town is built on a bold peninsula, which divides the inner and outer harbors. Here the Malabar invaders of Ceylon built the "Temple of a Thousand Columns," to which pilgrims flocked from all parts of India. This celebrated shrine was demolished in 1622 by the Portuguese, who fortified the heights with the materials derived from its destruction. It was next held by the Dutch, and subsequently by them and the French alternately, till the capture of Ceylon by the British in 1795. The Bay of Trincomalee is landlocked; the harbor is renowned for its extent and security; unlike every other in the Indian seas, it is accessible to every description of craft in every variation of weather, but it lies out of the course of trade, Colombo having in this respect a great advantage over it. Pop. about 12,000.

TRINE, RALPH WALDO, an American author; born in Mt. Morris, Ill., Sept. 9, 1866; was graduated at Knox College, Galesburg, Ill., in 1891, and then pursued studies in history and social and political science at Johns Hopkins University. He became deeply interested in social problems; was made director of the American Humane Society and the Massachusetts Society for the Prevention of Cruelty to Animals. His publications include: "The Life Books" (3 vols. 1896-1898); "The Greatest Thing Ever Known" (1898); "Every Living Creature" (1899); "Character-Building Thought Power" (1900); "Land of Living Men" (1910); "The New Alinement of Life" (1913).

TRINIDAD, a city and county-seat of Las Animas co., Col.; on Las Animas river, and on the Atchison, Topeka and Santa Fe, the Union Pacific, the Denver and Rio Grande, the Colorado and Southern, and the Colorado and Wyoming railroads; 200 miles S. of Denver. Here are National and savings banks, numerous churches, St. Joseph's Academy, several daily and weekly newspapers, and electric lights. The city has grist mills, railroad car shops, powder mills, etc. Pop. (1910) 10,204; (1920) 10,906.

TRINIDAD, one of the British West India islands; in the extreme S. of the group, being only 7 miles from the coast of Venezuela, the Gulf of Paria (an extremely safe anchorage) lying between. It is about 50 miles long, varying in breadth from 30 to 35 miles; area, 1,755 square miles. Three ridges of mountains run E. and W., one fringing the N. coast and reaching an elevation of 3,000 feet. The island has several tolerably large rivers. A remarkable phenomenon

is a pitch lake near the village of La Brea, composed of bituminous matter which forms natural asphalt, and is about 3 miles in circumference, and 138 feet above the sea. The soil is very rich and productive. The climate is hot and moist, but not unhealthy; the mean maximum is 87.7°, and the mean minimum 70° F.; and the rainfall is about 74 inches. The chief town, Port of Spain, is one of the finest towns in the West Indies (pop. 60,000). There is another town called San Fernando (pop. 7,000), with two or three pretty villages. The most important products are cocoa, sugar, rum, molasses, coffee, cocoanuts, tobacco, bitters, asphalt and fruit. A third of the trade is with Great Britain, and a fourth with the United States. Pop. about 275,000, mainly French (speaking a patois), with Spanish and English colonies, and many East Indian coolies. There are over 95 miles of railway in the island, which with Tobago forms a crown colony, ruled by a governor, an executive council, and a legislative council. Trinidad was discovered by Columbus in 1498, but no permanent establishment was founded there till 1532 by the Spaniards. It suffered at the hands of the English (Sir Walter Raleigh in 1595), the Dutch (1640), and the French (1677 and 1690). In 1797 it first fell into the hands of the British, who were confirmed in possession of it in 1802.

TRINITARIANS, an order of monks founded at Rome in 1198 by St. John of Matha, a native of Provence, and an old French hermit, Felix of Valois, to redeem Christian captives out of the hands of the infidels. The order was sanctioned by Innocent III.; the rule was that of St. Austin, with particular statutes; the diet was of great austerity; and the habit, at least in France, was a soutane and scapular of white serge, with a red and blue cross on the right breast. At one time the order possessed 250 houses, and it was estimated in the 17th century, that, since its foundation, it had been instrumental in rescuing more than 30,000 Christian captives from what was practically slavery. A reform took place in 1599, and resulted in the erection of the congregation of Discalced Trinitarians in Spain, in which country the order (reformed and unreformed) was suppressed in the reign of Isabella II.

TRINITROTOLUENES, substances formed by the nitration of toluene, having the general formula $C_6H_2CH_3(NO_2)_3$. There are three compounds of this name, all having the same chemical constitution, but differing in the arrangement of the nitro groups in the molecule. These three are known respectively as A, B, and Γ trinitrotoluene. The most important of the three is A or symmetrical trinitrotoluene, which forms the constituent of the explosive well known as T. N. T. B and Γ trinitrotoluene, when fused with sodium sulphide and sulphur, yield dyes which give a deep khaki-brown shade. Most of the T. N. T. used for explosive purposes contains small amounts of the B and Γ isomers, but for some purposes a very pure T. N. T. is required, and this is produced by recrystallizing the crude product from various solvents such as alcohol, benzene or a mixture of the two. The nitration of toluene can be carried out in two stages or in three. In the three-stage process, mono-nitrotoluene is first produced by nitrating toluene with a comparatively weak solution of mixed nitric and sulphuric acids. From this, by further nitration, dinitrotoluene is produced, and finally by treating the dinitrotoluene with strong mixed acids, trinitrotoluene is produced. By the two-stage process, mononitrotoluene is first produced, as above, and then converted direct to trinitrotoluene by treatment with strong mixed acids. A one-stage process has been tried, but is viewed with disfavor, owing to the danger of introducing strong acid direct into toluene. See EXPLOSIVES.

TRINITY, a term used to express the doctrine of Three Persons in one Godhead, which is held alike by the Roman, Greek, and Anglican Churches, and by the greater number of Nonconformist communions. It is indicated in the Apostles' Creed, stated more explicitly in the Nicene Creed, and set out at length in the Athanasian Creed. The First Article of the Church of England states the doctrine in terms that would be accepted by sister churches, and by orthodox dissenters generally: "There is but One Living and True God. . . . And in Unity of this Godhead there be Three Persons, of one substance, power and eternity; the Father, the Word, and the Holy Ghost." Protestant theologians deduce the doctrine of the Trinity from texts in which (*a*) the Unity of God is affirmed (Deut. vi: 4; Isa. xliv: 6; Mark xii: 29-32; Eph. iv: 6); (*b*) the Divinity of Christ is shown from the fulfillment of Messianic prophecies, or directly affirmed (I Pet. ii: 7, 8; Isa. viii: 13, 14; John xii: 41; Isa. vi: 1; II Pet. iii: 18; Isa. xliii: 11; Rev. xxii: 13; Isa. xliv: 6; Matt. xi: 10; Mal. iii: 1; I Cor. x: 9; Ps. lxxviii: 18 and xcv: 9; John iii: 29; Isa. liv: 5; John i: 1, xiv: 11, xx:

28; Rom. ix: 5; III Cor. v: 19, 20; Col. ii: 8, 9; II Pet. i: 2; I John v: 20); and (*c*) the Divinity of the Holy Ghost is affirmed (Matt. ix: 38; Acts xiii: 4; John vi: 45; I Cor. ii: 13; John xiv: 17; I Cor. xiv: 25; Ezek. viii: 1-3; Matt. xii: 28; Acts v: 9; I Cor. ii: 11; II Cor. i: 3). The word "Trinity" is not found in the Scriptures, and is said to have been first used by Theophilus, Bishop of Antioch, in the 2d century.

TRINITY BAY, a large bay on the N. E. coast of Newfoundland. The peninsula of Avalon is nearly surrounded by it. Its chief ports are Trinity and Heart's Content.

TRINITY COLLEGE, an American educational institution, established in Hartford, Conn., in 1823. It bore the name of Washington College till 1845. At the close of 1919 it reported: Professors and instructors, 17; students, 200; president, F. S. Luther, LL. D.

TRINITY COLLEGE, a coeducational institution in Durham, N. C.; founded in 1853 under the auspices of the Methodist Episcopal Church; reported at the close of 1919: Professors and instructors, 61; students, 896; president W. P. Few, LL. D.

TRINITY COLLEGE, a famous institution in Cambridge, England; founded by Henry VIII. in 1546 on the site and out of the revenues of Michael-house (1324), King's Hall (1337), and other ancient societies. To the 60 fellowships and scholarships of his foundation Queen Mary added 20 scholarships. The fellows, with certain exceptions, must take holy orders within seven years after their M. A., and the college may elect professors or other distinguished literary or scientific men to regular or honorary fellowships. The greatest of all the Cambridge colleges, Trinity, is more conspicuous for the extent than the special architectural beauty of its buildings. Noteworthy, however, are Nevill's Fountain, the three great gateways by which the three chief courts are entered, the Gothic Hall with its high-peaked roof, the chapel (redecorated 1875), the library designed by Wren, the Masters' Lodge, with its state rooms, where royalty and judges are received, and the rich collection of busts and statues of former members—of Newton by Roubillac, Porson by Chantrey, Byron by Thorwaldsen, Barrow, Macauley, Whewell, Sedgewick, Tennyson, etc.

TRINITY COLLEGE, a noteworthy college in Oxford, England; founded by Richard de Hoton, Prior of Durham, in 1290, for the education of student-monks of Durham. It was the first college after Balliol, which was founded by a layman, and was further remarkable as having been, like St. John's, founded by a Roman Catholic after the Reformation. It was rebuilt and improved by Sir Thomas Pope, in 1554. A Renaissance chapel was built in 1694, in which is a fine altar-piece, and a beautiful carved screen.

TRINITY COLLEGE, or **THE UNIVERSITY OF DUBLIN**, the largest and most important educational institution in Ireland. It is believed to have been founded by Queen Elizabeth in 1591, though some authorities assert that she merely endowed and Protestantized the school. These latter give the credit for its establishment to Alexander Bigner or Bignor, an ecclesiastic of the 13th century. It has extensive buildings which inclose several quadrangles. Corinthian columns ornament the principal front, the chapel has a Corinthian portico and the decorations of the fine library are also Corinthian.

TRINITY HOUSE, a name borne by five maritime societies of Great Britain situated in London, Hull, Newcastle-on-Tyne, Leith, and Dundee. Probably all, or most of them, were originally partly religious and partly secular establishments founded by seamen, their chief original objects being probably mutual assistance and the care of aged and infirm seamen. From the 14th century onward various public duties and privileges were assigned to them by royal charters or acts of Parliament, such as providing lighthouses, buoying channels, and licensing pilots; and powers were given to them to levy dues on shipping or cargoes. With one important exception, these duties and powers have been reduced or withdrawn. Dundee House is now only a benefit society. Leith retains its public duties as a pilotage authority, as also do Newcastle and Hull, while the last also looks after the lighthouses and buoys of the Humber. All of them continue to give pensions, or homes and pensions, to members, and some assistance to destitute seafarers.

TRINITY RIVER, a river in northwestern California. It enters the Klamath river in Humboldt county. It is about 130 miles long. A river in Texas, formed by branches called the Elm or East Fork, and West Fork, which unite in Dallas county about 4 miles above Dallas. It is about 500 miles long and is navigable, except at low water, for nearly 350 miles. It flows through a very fertile region.

TRINITY SUNDAY, the Sunday after Whitsunday. It was definitely established as a Church festival by Pope John XXII. in 1334. All the principal feasts occur in the half-year between Advent Sunday and Trinity, and all the Sundays from Trinity to Advent are called Sundays after Trinity.

TRINUCLEUS, the type genus of *Trinucleidæ*. Body distinctly trilobed; margin of head-shield composed of two lamellæ, and perforated by numerous formamina; genal angles prolonged into conspicuous spines, usually single, but forked in *T. pongerardi;* glabella prominent and pear-shaped with mere traces of lateral grooves; facial sutures rudimentary; cheeks tumid, and generally furnished on each side with a small tubercle seemingly representing the eyes; body rings six; tail triangular, with a distinct axis, and having its margin entire and striated.

TRIO, a musical composition for three voices or for three instruments.

TRIOXIDE, a term applied to an oxide in which one atom of the metal is combined with three atoms of oxygen, thus: chromium trioxide, CrO_3.

TRIPLE ALLIANCE, an alliance between the States-General and England, against France, for the protection of the Spanish Netherlands; was ratified Jan. 23, 1668. Sweden joined the league, April 25, and it then became known as the Triple Alliance. Another called the Second Triple Alliance, between England, France and Holland, to oppose the designs of Cardinal Alberoni, the Spanish minister; signed by the English and French, Nov. 28, 1716, and by the Dutch at The Hague, Jan. 4, 1717. A Triple Alliance between Great Britain, Russia, and Austria, was concluded against France at St. Petersburg, Sept. 28, 1795.

The fourth Triple Alliance was based on a treaty between Austria and Germany, concluded on Oct. 7, 1879, at Gastein. The alliance was defensive only, stipulating that in case of an attack by Russia on either of the signatories, the other was to assist with all its armed forces. In 1882 Bismarck succeeded in overcoming Italy's enmity toward Austria and having her included in the alliance, which from then on was known as the "Triple Alliance," and which endured until the World War, when Italy espoused the cause of the Allies. The treaty creating the Alliance was not continuous, but was subject to renewal at regular intervals, the last renewal being made in 1912. The adherence of Italy to the Alliance was brought about by her fear of France, especially in Africa. The seizure of Tunis by France in 1881 was undoubtedly more responsible for this action on the part of Italy than any other single factor. On the other hand, however, Austria's retention of the territories in the southern Tyrol populated almost entirely by Italians made it extremely difficult for Italy to assume even a diplomatic friendship for her northern neighbor. Eventually, after the outbreak of the World War, it was this side of the balance which weighed down heaviest, especially as France had, long before the war, come to an amicable agreement with Italy over their separate interests in north Africa.

TRIPLE ENTENTE, the understanding between England, France and Russia which caused England and France to support Russia when the latter was threatened by Austria and Germany shortly before the outbreak of the World War. The Triple Entente had its origin in a series of treaties and diplomatic understandings rather than in any one document. It evolved from a treaty between France and Russia, signed in 1891, by which each of the two countries promised economic and diplomatic support in case either should be attacked by an enemy. The following year this was strengthened by a military convention, which was still further strengthened into the Dual Alliance in 1894. The first steps toward including Great Britain in the understandings were taken in 1903, when an interchange of official visits was made between France and England, and the century-long mutual prejudices were overcome. In bringing about this better understanding no single individual had more influence than King Edward VII. In 1907 the mutual jealousy between England and Russia was also reduced through an understanding which was arrived at between the two governments respecting their separate spheres of interest in Persia and other parts of Asia. This understanding may be said to have concluded the creation of what then became known as the Triple Entente.

TRIPLE STAR, a star which, under a powerful telescope, is resolved into three, often of different colors. Gamma Andromedæ is a triple star. Its principal constituent is of the third magnitude, and of an orange-yellow color. The two others seem like a single one between the fifth and sixth magnitude; both are bluish.

TRIPLET, in music. a combination of three notes to be played in the time

of two. They are joined by a slur and distinguished by having the figure 3 above them.

TRIPOLI, formerly a province of the Ottoman empire; the extreme E. of the Barbary states of north Africa, stretching along the whole extent of both the greater and lesser Syrtes (the gulfs of Cabes and Sidra); bounded on the W. by Tunis, on the S. (very vaguely) by the Libyan Desert and Fezzan, on the E.—if we include the plateau of Barca—by Egypt, and on the N. by the Mediterranean Sea; area estimated at over 400,000 square miles. Pop. about 530,000. Tripoli is less mountainous than the rest of Barbary, for the Atlas range terminates here in a couple of chains running parallel to the coast and never exceeding 4,000 feet in height. There are no rivers, and rain seldom falls during the long hot summers, but the heavy dew supports vegetation in favored spots. The climate is extremely uncertain. The coast region (about 1,100 miles in length) is very fertile about Tripoli and Mesurata, where all sorts of tropical fruits, grain, wine, cotton, madder, etc., are produced; but further E., along the shores of the Gulf of Sidra, reigns sandy desolation. The interior yields senna, dates, and galls, and the carob and lotus are indigenous. Sheep and cattle are reared in great numbers, and there is a hardy breed of small but excellent horses, besides strong and beautiful mules. The commerce of the country consists in exporting, principally to Malta and the Levant, the products of the country and of the interior of Africa (gold dust, ivory, natron, and ostrich feathers), which are brought hither in caravans across the desert. The imports (which consist chiefly of European manufactures) have been declining gradually of late years, owing partly to the new direction which the trade of central Africa is assuming, and partly to the abolition of the slave trade, which stopped the demand for many of the commodities that supported the traffic.

From the Phœnicians Tripoli passed into the hands of the rulers of Cyrenaica (Barca), from whom it was wrested by the Carthaginians. It next belonged to the Romans, who included it within the province of Africa, and gave it the name of Regio Syrtica. About the beginning of the 3d century A. D. it became known as the Regio Tripolitana (on account of its three principal cities, Œa, Sabrata, and Leptis, which were leagued together), and was probably raised to the rank of a separate province by Septimius Severus, who was a native of Leptis. Like the rest of north Africa, it was conquered by the Arabs early in the 8th century, and the feeble Christianity of the natives was supplanted by a vigorous and fanatical Mohammedanism. In 1510 it was taken by Don Pedro Navarro for Spain, and in 1523 it was assigned to the Knights of St. John, who had lately been expelled by the Ottoman Turks from their stronghold in the Island of Rhodes. The knights kept it with some trouble till 1551, when they were compelled to surrender to the Turkish admiral Sinan, and Tripoli henceforward joined in the general piracy which made the Barbary states the terror of maritime Christendom. In 1714 the ruling pasha, Ahmad Karamânlî, assumed the title of bey, and asserted a sort of semi-independence of the Sultan, and this order of things continued under the rule of his descendants, accompanied by the most brazen piracy and blackmailing, till 1835, when the Porte took advantage of an intestinal struggle in Tripoli to reassert its authority. A new Turkish pasha, with vice-regal powers, was appointed and the state was made a vilâyet of the Ottoman empire.

Italy had long claimed that Tripoli fell within her zone of influence and that she had the right to preserve order within the state. In order to protect her citizens residing in Tripoli from further indignities from the Turkish Government, Italy, on Sept. 29, 1911, declared war against Turkey and announced her intention of annexing Tripoli. On Sept. 30 a force of 40,000 men was sent to occupy the city of Tripoli. On Oct. 1, 1911, a naval battle was fought at Prevesa, European Turkey, and three Turkish vessels were destroyed. By the Treaty of Lausanne Italian sovereignty was acknowledged by Turkey, although the Caliph was permitted to exercise religious authority.

TRIPOLI, probably the Œa of antiquity, called in Arabia Tarâbulus, or Tarabulus Gharb ("Tripoli of the West"), the capital of the territory of the same name; lies on the edge of the desert, on a point of rocky land projecting into the Mediterranean and forming a bay. It is a typical Moorish city irregularly built, surrounded by high bastioned walls and celebrated for its beautiful gardens. There are many mosques, besides several large churches. Though the majority of the inhabitants are Moslems, nearly all the trade is in the hands of Jews and Christians. Pop. about 75,000.

TRIPOLITAN WAR, a war between the United States and Tripoli in 1801-1805. It was caused by the refusal of

the United States to increase its payment for immunity from the depredations of the Tripolitan corsairs. After several conflicts by sea and land, peace was concluded June 4, 1805.

TRIPOLITZA, a town of southern Greece, in the province of Arcadia. Previous to the revolution it was the capital of Morea, but Ibrahim Pasha took possession of it in 1828 and razed it to the ground. It has since been rebuilt. Pop. about 12,000.

TRIPPANT, in heraldry, a term applied to beasts of chase, as passant is to beasts of prey, etc. The animal is represented with the right foot lifted up, and the other three, as it were, on the ground, as if trotting. Counter trippant is when two animals are borne trippant contraryways, as if passing each other out of the field.

TRIPTOLEMUS, in mythology, the son of Celeus, King of Attica, by Neæra. The goddess Ceres wished to make him immortal, but was prevented through the meddling curiosity of his mother. She, however, taught him agriculture, and rendered him serviceable to mankind by instructing him how to sow corn and make bread. She also gave him her chariot, drawn by two dragons, in which he traveled over the earth, and distributed corn to all the inhabitants of the world.

TRIPTYCH (trip'tik), a writing tablet in three parts, two of which might be folded over the middle part; hence sometimes an ecclesiastical register of names on a triple tablet, or a book or treatise in three parts or sections. Also a picture, carving, or other representation, generally on panel, with two hanging doors or leaves, by which it could be closed in front. Triptychs were constructed of various materials and dimensions; ivory and enameled triptychs were adorned with sacred subjects and emblems. They were frequently used for altar pieces. The central figure is usually complete in itself. The subsidiary designs on either side of it are smaller, and frequently correspond in size and shape to one-half of the principal picture.

TRIREME, in classical antiquity, a galley or vessel having three ranks or benches of oars on each side, a common class of war ship among the ancient Romans, Greeks, Carthaginians, etc. They were also provided with large square sails, which could be raised during a fair wind, to relieve the rowers. When two ships engaged, if tolerably well matched, the great object aimed at by each was, either by running up suddenly alongside of the enemy, to sweep away or disable a large number of his oars, or, by bearing down at speed, to drive the beak full into his side or quarter, in which case the planks were generally stove in, and the vessel went down. But if one of the parties was so decidedly inferior in seamanship as to be unable to cope with his antagonist in such maneuvers, he endeavored, as he approached, to grapple with him, and then the result was decided, as on land, by the numbers and bravery of the combatants.

TRISAGION, one of the doxologies of the Eastern Church, repeated in the form of versicle and responses by the choir in certain parts of the liturgy, and so called from the triple recurrence in it of the word *hagios*=holy.

TRISTAN, or **TRISTRAM**, the center figure of a circle of old Celtic myths, which with countless modifications and additions afterward appeared in all the chief European literatures. According to the story, Tristan, son of Rouland Rise, Lord of Ermonie, and Blanche Fleur, sister of Mark, King of Cornwall, was sent by his uncle to woo vicariously and bring home as bride to the British king the fair Isolt, Yseult, or Ysonde, princess of Ireland. Tristan does so, but they unfortunately partake of a love charm which is not intended for them. They fall passionately but hopelessly in love with each other. The intrigue was carried on for years, and the story narrates the adventures—grave and gay—which resulted from the somewhat difficult position of the actors. They died simultaneously, and the king generously allowed them to be buried side by side. But "even in our ashes live their wonted fires," a vine and a rose-bush grew from the graves, and, meeting, twined amorously their branches together. The most important romance extant on the subject is that composed about 1170 by the Norman-English chevalier, Luce de Gast. The legend got abroad to France, and from thence mixed with the Arthurian myths to Germany, where Gottfried of Strassburg renarrated part of the story in a lively poem (1210), which had great popularity in the Middle Ages. Hans Sachs is one among a host of old writers who have treated the subject. The Auchinleck MS. of "Sir Tristan" was published by Walter Scott in 1806.

TRISTAN DA CUNHA (dä-kön' yä), the largest of three islands in the South Atlantic (the others being Nightingale and Inaccessible Island), about 1,500 miles S. W. of St. Helena. It is mountainous, and one peak rises to the

height of 7,640 feet. The island was taken possession of by Great Britain in 1817.

TRITON, in classical mythology, a powerful sea deity, son of Poseidon (Neptune) by Amphitrite, or, according to some, by Sileno or Salacia. He dwelt with his father in a golden palace on the bottom of the sea. He could calm the ocean, and abate storms. He was generally represented as blowing a shell, and with a body above the waist like that of a man, and below like a dolphin. Many of the sea deities were called Tritons by the poets.

TRITON, in zoölogy: (1) A genus of *Salamandrinæ*, with 16 species, widely distributed in temperate and sub-tropical regions. Body covered with warty tubercles, four toes on anterior, and five on posterior limbs, all without nails; no parotids; glandular pores above and behind the eyes, and a series of similar pores arranged longitudinally on each side of the body; male with well-marked discontinuous crest on back and tail; tongue globular, partially free at the sides, free behind where it is pointed. In North America, *Diemictylus viridescens* is one of the most common species. (2) A genus of *Muricidæ* (Woodward), according to some other authorities, of *Cassididæ*, with 100 recent species, from the West Indies, Mediterranean, Africa, India, China, the Pacific, and western Australia, ranging from low water to 10 or 20 fathoms, and one minute species has been dredged at 50 fathoms. The Great Triton (*T. tritonis*) is the conch blown as a trumpet by the Australian and Polynesian natives. Fossil species 45, from the Eocene of Great Britain, France, and Chile.

TRITONE, the augmented fourth in music; that is, a succession of three whole tones. It is not approved for a progression in harmony and is used sparingly, and earlier never.

TRITONIA, in botany, a genus of *Iridaceæ;* about 25 species, all from southern Africa; are cultivated in greenhouses; they have yellow, orange, pink, red, blue, or greenish flowers, and are handsome when in bloom. In zoölogy, the type genus of *Tritoniadæ*, with 13 species, from Norway and Great Britain; found under stones at low water to 25 fathoms. Animal elongated; tentacles with branched filaments; veil tuberculated or digitated; gills in a single series; mouth with horny jaws, stomach simple.

TRIUMPH, in Roman antiquities, a grand procession, in which a victorious general entered the city by the Porta Triumphalis, in a chariot drawn by four horses, wearing a dress of extraordinary splendor, namely, an embroidered robe, an under garment flowered with palm leaves, and a wreath of laurel round his brows. He was preceded by the prisoners taken in the war, the spoils of the cities captured, and pictures of the regions subdued. He was followed by his troops; and, after passing along the Via Sacra and through the Forum, ascended to the capitol, where he offered a bull in sacrifice to Jove.

A naval triumph differed from a military one only in being on a smaller scale, and in being characterized by the exhibition of nautical trophies, such as beaks of ships. An ovation was an honor inferior to a triumph, the chief difference being that in the former the victorious general entered the city on foot, and in later times on horseback. The Senate claimed the exclusive prerogative of granting or refusing a triumph.

TRIUMVIR, in Roman government, one of the three men united in office. The triumvirs were either ordinary magistrates (as the triumviri capitales, who were police commissioners, having charge of the jails, and acting as magistrates, the triumviri monetales, who were commissioners of the mint, and had the charge of coining money), or they were extraordinary commissioners appointed to jointly execute any office. The term is specifically applied to the members of the two triumvirates.

TRIUMVIRATE, a coalition of three men in office or authority; specifically applied to two great coalitions of the three most powerful individuals in the Roman empire for the time being. The first of these was effected in the year 60 B. C., between Julius Cæsar, Pompey, and Crassus, who pledged themselves to support each other with all their influence. This coalition was broken by the fall of Crassus at Carrhæ in Mesopotamia; soon after which the civil war broke out, which ended with the death of Pompey, and establishment of Julius Cæsar as perpetual dictator. After his murder, 44 B. C., the civil war again broke out; and after the battle of Mutina, 43 B. C., Antony, Octavius, and Lepidus coalesced, thus forming the second triumvirate. They divided the provinces of the empire; Octavius taking the West, Lepidus Italy, and Antony the East.

TROCHA, a Spanish word denoting a military highroad. The trocha played an important part as a barrier in the Cuban insurrection in 1895-1898. It consisted of a clear space 150 to 200 yards wide,

stretching through an apparently impassable jungle for 50 miles bordered by fallen trees and a maze of barbed wire. Through the center of the clearing ran a single-track military railroad, and on one side of that a line of forts.

TROCHILIDÆ, the humming birds, a family of insessorial birds, containing above 300 species, divided into about 75 genera or subgenera. The trochilidæ include some of the smallest known birds, many of which are remarkable for the wonderful splendor of their plumage. In this one respect alone, neither pen nor pencil could convey any adequate idea of their dazzling luster. They are active little birds, and from the structure of their frames, it is apparent that they were intended to pass most of their time on the wing. Their food consists of small insects, and perhaps the nectareous juices of flowers, which their tongue is beautifully fashioned for obtaining. This organ is very long, and can be darted out of the bill to a considerable length, by a sudden motion like that of a spring. Their feet are small, generally dark-colored. Their wings are very long and narrow, and they are, by means of the rapid motion given to them, able to balance themselves in the air, hovering round flowering shrubs and plants, probing their tubular nectaries, and at the same time emitting a pretty loud humming noise, caused by the concussion of their wings with the air; whence their English name "humming birds." The trochilidæ are very pugnacious little creatures, and defend their nests with the greatest courage against all intruders, even man himself. They are natives of America, and are found from one extent of the continent to the other, though in greatest numbers in the tropical parts, in the deltas, and along the banks of the great rivers both of the North and South. *Mellisuga humilis*, a species peculiar to the West Indies, has a very sweet note, and is perhaps the only species of the family that has a real song. The male bird of this variety is about 2½ inches in length, and is exactly like a bumblebee when darting about in the air. The nests of the humming birds are wonderfully made, with cotton, wool and twigs, beautifully interwoven with feathers, and lined with down, and almost all the species lay two eggs, which in some cases are extraordinarily small. The smallest species of all is the *Mellisuga minima*, which is only about one inch and a quarter in length, and which weighs but 20 grains.

TROCHILUS, in ornithology: (1) The type genus of *Trochilidæ*. Tail-feathers pointed, wings short; plumage not very brilliant, except on the throat. Two species are known—*T. colubris*, inhabiting North America during the summer, and migrating in winter to Central America and the West India islands; and *T. alexandri* from California and Mexico. (2) *Charadrius melanocephalus*, a native of Egypt. It is about 10 inches long; general hue slate color; abdomen and neck white, head black, with two white stripes running from the bill, and meeting at the nape of the neck, black mantle extending over the shoulders to the tail, wings black, with a broad transverse black band.

TROCHU (trō-shü'), **LOUIS JULES**, a French military officer; born in Le Palais, France, March 12, 1815; was educated at St. Cyr; engaged in the Algerian, Crimean and Italian campaigns published a pamphlet entitled "The French Army in 1867," and showed the weakness of the French army, by which he forfeited the favor of Napoleon. At the outbreak of the Franco-Prussian War (1870), however, he was made Governor of Paris, and when the republic was proclaimed he was intrusted with the defense of the city, a position which he held till the capitulation. He was elected to the National Assembly in 1871 and retired to private life in 1873. He wrote: "For Truth and Justice" (1873); "Politics and the Siege of Paris," and "The French Army in 1879." He died Oct. 7, 1896.

TRŒZEN, a very ancient Greek city, capital of the S. E. district of Argolis. It was the birthplace of THESEUS (*q. v.*).

TROGLODYTE. See CAVE DWELLERS.

TROGLODYTES, in ornithology, the wren; a genus of *Troglodytidæ* or *Troglodytinæ*, from the Neotropical, Nearctic and Palæarctic regions. Bill moderate, compressed, slightly curved, without notch, pointed; nostrils basal, oval, partly covered by a membrane; wings very short, concave, rounded; tail generally short; feet strong, middle toe united at the base to outer, but not to middle toe; tarsus rather long; claws long, stout, and carved.

In zoölogy a genus of *Simiinæ*. Head not produced vertically; arms not reaching more than half down the shin; ribs 13 pairs; os inter-medium absent from the carpus; no ischiatic callosities; hair black, dun, or gray. The genus is confined to the west African sub-region, ranging from the coast about 12° N. and S. of the equator, from the Gambia to Benguela, and as far inland as the great equatorial forests extend. The number of species is not accurately determined;

three, however, are well known, and have been carefully described: *T. gorilla*, the gorilla; *T. niger*, the common, and *T. calvus*, the bald chimpanzee. There are probably other species, since Livingstone met with what he supposed to be a new species in the forest region W. of the Nile, and another has been described by Gratiolet and Alix.

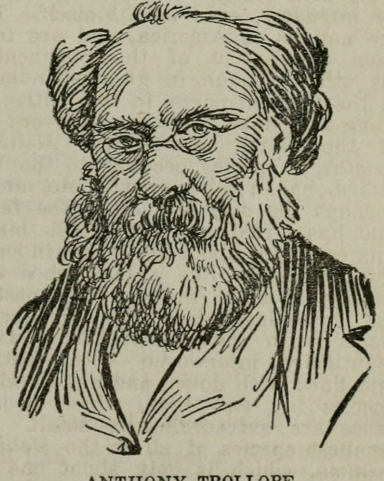
TROGLODYTIDÆ, in ornithology, the wrens, a family of *Passerine* birds with 17 genera and 94 species. They are rather abundant and varied in the Neotropical region, with a few species scattered through the Nearctic, Palæarctic, and parts of the Oriental region. The constitution of the family is by no means well determined.

TROGLODYTINÆ, a sub-family of *Timaliidæ* distinguished by the bill being long and curved, short in proportion to the body.

TROGONIDÆ, in ornithology, a family of picarian birds, with seven genera and 44 species. They are tolerably abundant in the Neotropical and Oriental regions; and are represented in Africa by a single genus: bill short, strong, with a wide gape; tail generally long and in some species very long; feet small and often feathered almost to the toes, two of which are placed in front and two behind. They form a well-marked family of insectivorous forest-haunting birds of small size, whose dense, puffy plumage exhibits the most exquisite tints of pink, crimson, orange, brown or metallic green, often relieved by delicate bands of pure white. In one Guatemalan species, *Pharomacrus mocinno*, the long-tailed trogon or quesal, the tail coverts are enormously lengthened into waving plums of rich metallic green, as graceful and marvelous as those of the birds of paradise. Trogons are unable to use their feet for climbing, and usually take their station on the branches of a tree, dashing on insects as they fly past, or on some fruit at a little distance from them, and returning to their seat to eat what they have secured.

TROJAN WAR, THE, a legendary war which forms the theme of the "Iliad" of Homer. The story briefly told is that Paris (Alexander), son of Priam, King of Troy, carried off Helen, wife of Menelaus, King of Sparta; that the Achæan princes, under the command of Menelaus' brother, Agamemnon, King of Mycenæ, undertook to recover Helen; that the Achæans, having besieged Troy for nine years, eventually sacked the city and recovered Helen. These events were regarded as historical not only by the Greeks themselves, but by the moderns as late as the first half of the 19th century, and a date (1184 B. C.) was assigned with as much precision and confidence to the fall of Troy as to the fall of man. But the remarkable revolution in the views of scholars about mythology, begun by Lobeck in 1829, and by the brothers Grimm, led to the belief that the war was legendary. Many of the incidents were shown to be myths common to most Indo-European nations at least. The account of which Homer left to us of the struggle to avenge the wrongs and woes of Helen is essentially a story in which the main chain of causation is superhuman, in which the gods mingle visibly with men, and the heroes themselves are the sons or husbands of immortal beings. The legend of Troy was a favorite subject of the poets of the Middle Ages and took varied forms differing from the Greek version of the event and dwelling on the heros descended from the exiled Trojans. The excavations of Dr. Schliemann reawakened the question of a historical basis for the Trojan War. See TROY.

TROLLEY, a word originating in England applied at first to a handcart and afterward to a truck. In the United States, a trolley means a pulley running on an overhead wire. In electric railways this pulley is at the top of a long rod that acts as a conductor to transmit the electric current to the motor of a street car. By extension, the word trolley is applied to the car and to the system as a whole. See STREET RAILWAYS.



ANTHONY TROLLOPE

TROLLOPE, ANTHONY, an English novelist: born in London, England, April 24, 1815; a younger son of

Frances M. Trollope. He was educated at Harrow and Winchester; in 1834 became a clerk in the postoffice, and in 1841 was appointed clerk to a postoffice surveyor in Ireland. His Irish experiences gave him material for his first novels, "The Macdermots of Ballycloran" (1847), and the "Kellys and the O'Kellys" (1848), neither of which was successful. His first success was "The Warden" (1855); followed by "Barchester Towers" (1857); "Dr. Thorne" (1858); "The Bertrams" (1859); "Framley Parsonage" (1861); "The Struggles of Brown, Jones, and Robinson" (1862); "Orley Farm" (1862); "The Last Chronicles of Barset" (1867); "Ralph the Heir" (1871); "The Way We Live Now" (1875); "The Prime Minister" (1876); "Marion Fay" (1882); "The Land-Leaguers" (1883); etc. He also published accounts of his travels, including "The West Indies and the Spanish Main" (1859); "Australia and New Zealand" (1873); "South Africa" (1878); besides a "Life of Cicero" (1881). He died in London, Dec. 6, 1882.

TROLLOPE, FRANCES M., an English author; mother of Anthony; born near Bristol, England, in 1780. In 1829 she visited the United States, and afterward published a volume entitled "Domestic Manners of the Americans" (1831). She followed this with the novel "The Refugee in America" (1832). Among her other works are: "The Abbess" (1833); "Tremordyn Cliff" (1835); "The Barnabys in America" (1843); "Life and Adventures of a Clever Woman" (1854); and "Fashionable Life; or, Paris and London" (1856). She died in Florence, Italy, Oct. 6, 1863.

TROLLOPE, THOMAS ADOLPHUS, elder brother of Anthony; born April 29, 1810. He was a constant contributor to English periodicals, and was Italian correspondent of the New York "Tribune." Among his many books are: "A Summer in Brittany" (1840); "A Summer in Western France" (1841); "La Beata" (1861); "Marietta" (1862); "Beppo the Conscript" (1864); "Lindisfarn Chase" (1864); "History of the Commonwealth of Florence" (4 vols. 1865); "Dream Numbers" (1868); "A Siren" (1870); "Life of Pius IX." (1877); "Sketches from French History" (1878); "What I Remember" (1887-1889). He died in Clifton, England, Nov. 11, 1892.

TROMBONE, a large, deep, and loud-toned instrument of the trumpet kind, the name being an augmentative of *tromba*, a trumpet. It consists of two tubes, so constructed that one may slide in and out of the other, and thus form one tube that can be lengthened at will and made of varying pitch. There are three kinds of trombones, called after their compass the alto, tenor, and bass trombones. Soprano trombones have also been made, but they are rarely used. The alto trombone has a compass of more than two octaves and a half, and is also known as the trombone in E flat. It is written on the C clef, third line. The tenor trombone is also known as the trombone in B flat. It is written on the C clef, fourth line. The bass trombone is the lowest of all in its range of notes, and is known as the E flat. It is written on the F clef; is an octave lower than the alto, and a fifth lower than the tenor. Some of these instruments are fitted with pistons, whence they are called valve trombones. Also a powerful reed stop in the organ, of 8 feet or 16 feet scale on the manuals and 16 feet or 32 feet on the pedals. In ordnance, a form of blunderbuss for boat service.

TROMP, MARTEN HARPERTZOON, VAN, a Dutch naval officer; born in Briel, Holland, in 1597. He began to serve under his father in the navy at 10 years of age, gradually rose to distinction, and in 1637 attained the rank of lieutenant-admiral; in which capacity he served against the Spaniards, and captured many of their ships. In October, 1639, he won a great victory over the Spanish fleet and captured 13 galleons. He was engaged in the naval campaigns of 1640 and 1641; but his courage and abilities were most strikingly displayed in the war with England in 1652-1653. He had Robert Blake for his adversary, and was defeated off Dover in March, 1652. In November following, he, in his turn, defeated Blake, and sailed up the English Channel with a broom at his masthead. Another engagement took place in the channel, in February, 1653, when the Dutch lost many of their ships, but Tromp succeeded in saving the 300 merchant ships he was convoying. After commanding in several other battles against the English, this great seaman fell in the engagement with Monk, off the coast of Holland, Aug. 8, 1653. His son, CORNELLUS VAN TROMP, born in Rotterdam, Holland, Sept. 9, 1629, rose also to eminence as a naval commander and, on De Ruyter's death, was appointed lieutenant-admiral-general of the United Provinces. He died in Amsterdam, May 29, 1691.

TRONDHJEM, also THRONDHJEM, a port of Norway, on the S. side of the long and narrow Trondhjem fjord; at the mouth of the little Nid river; 250 miles N. of Christiania. It is built on undulating slopes, and has regular and

broad streets, the houses being mostly of wood, though the building of new wooden houses is now forbidden by law. The (fortified) harbor is capacious, deep, and safe, but is difficult of entry. The most interesting building in the city is the venerable cathedral, a cruciform church dating partly from the 13th century, of English-Norman architecture, and unquestionably the most interesting ecclesiastical edifice in Norway. A great fire in 1530 destroyed most of the church except the richly adorned octagonal choir (late Gothic). The church, since 1818 the place of coronation of Norwegian kings, has been carefully restored since 1880. Portions of an old archiepiscopal palace (Kongsgaard) also survive. The town is the main emporium of a wide district of country, and has a large trade by sea and land; the exports include copper ore, herrings and other fish, train oil, timber, etc. The ancient capital of Norway, originally called Nidaros, Trondhjem was founded in 996 by Olaf Trygvason, and became in 1152 the seat of an archbishop. Its decline dates from the Reformation. It was taken by the Swedes after a siege of nine weeks, and has often been nearly destroyed by fire. Pop. about 45,000.

TROOPIAL, the name common to a group of passerine birds, akin to the orioles and starlings. They mostly inhabit the southern United States, but several of them appear as birds of passage in the northern States in early spring. The cow troopial, cow bird, or cow bunting, the blue bird, and the bobolink or rice bunting, belong to this group.

TROOSTITE, a variety of willemite, occurring in large opaque crystals, which are mostly impure from the presence of iron and manganese. Found with franklinite, etc., in the State of New Jersey.

TROPÆOLACEÆ, Indian cresses; an order of hypogynous exogens, alliance Malvales; smooth, twisting or twining herbs of tender texture and acrid taste. Peduncles axillary, one-flowered. Sepals three to five, generally with valvate æstivation, the upper one with a long spur; petals normally five, yellow, scarlet, orange, rarely blue, sometimes reduced to two or even one, convolute in æstivation; stamens 6 to 10; anthers two-celled; style one; stigmas three to five; ovary one, three-cornered; three or five carpels; ovules solitary; fruit indehiscent; seeds large, without albumen, filling the cell in which they are. Known genera 5, species 43. All from the temperate parts of America. The order was formed by the elevation of the tribe *Tropæoleæ;* now most botanists are reverting to the old arrangement.

TROPÆOLUM, in botany, the Indian cress, or nasturtium; the typical genus of *Tropæolaceæ;* calyx five-parted, the upper lobe spurred, petals normally five, unequal, the three lowest small or wanting; stamens eight, free; carpels three, kidney-shaped; fruit roundish, furrowed, indehiscent, the seed large, filling the cell; climbing plants from South America. Those best known are *T. majus*, the great, and *T. minus*, the small, Indian cress or nasturtium. The leaves of the first are peltate, nerved, orbicular, somewhat lobed, the nerves not mucronate; petals obtuse. It was brought at first from Peru. The second species is smaller than the last, with peltate nerves, orbicular leaves, deep yellowish flowers, streaked with orange and red. The berries of both species are gathered when green and made into a pickle, and used also as a garnish for dishes. *T. tricolorum* is a highly ornamental species, having the calyx wavy, scarlet, tipped with black, and the petals yellow. *T. canariense* is a climbing variety known as the Canary creeper. Of late years florists have succeeded in obtaining endless varieties of colors of *Tropæolum.*

TROPE, in rhetoric, a term applied to a word or expression diverted from its original to a figurative signification, and thus including allegory, irony, metaphor, metonymy, synecdoche, etc.

TROPHONIUS, the fabled builder of the temple of Delphi, after his death was reverenced as a hero, and had a famous oracle in a cavern near Lebadeia in Bœotia. Pausanias describes how, after purifying himself, he was drawn through the mouth of this cave by an unseen power, and all that he witnessed there. Don Quixote's fancied visit to the oracle preserves its memory.

TROPHY, a monument or memorial in commemoration of a victory. It consisted of some of the arms and other spoils of the vanquished enemy, hung upon the trunk of a tree or a pillar by the victors, either on the field of battle or in the capital of the conquered nation. If for a naval victory, it was erected on the nearest land. The trophies of the Greeks and Romans were decked out with the arms of the vanquished for land victories, with the beaks of the enemy's vessels for naval engagements. In modern times trophies have been erected in churches and other public buildings to commemorate a victory. Also, anything taken and preserved as a memorial of victory, as flags, standards, arms, and the like.

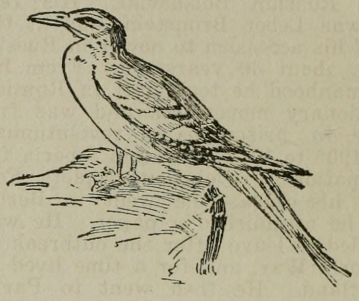
TROPIC, in astronomy, one of the two small circles of the celestial sphere, situated on each side of the equator, at a distance of 23° 28′, and parallel to it, which the sun just reaches at its greatest declination N. or S., and from which it turns again toward the equator, the N. circle being called the Tropic of Cancer, and S. the Tropic of Capricorn, from the names of the two signs at which they touch the ecliptic.

The stars are brighter in the tropics than in the temperate zones, and astronomical observation is easier. Cyclones arise within the tropics. The characteristic vegetation of the tropics consists of gigantic endogens, as palms, some of which rise to a height of from 100 to 200 feet. More polypetalous exogens are arborescent than in temperate climes. The *Coniferæ* exists chiefly on mountains. Ferns abound in tropical islands, and deltas where water is plentiful, so that in some localities from 250 to 300 species may be gathered. The tropical type of vegetation was separated at a remote period into two portions, one in the Old World, the other in the New. Shells are brighter than in lands where the sun is less powerful, the birds more numerous and of gayer plumage, the feline tribe larger and in greater numbers.

In geography, one of the two parallels of terrestrial latitude corresponding to the celestial tropics, being at the same distance from the terrestrial equator as the celestial tropics are from the celestial equator. The one N. of the equator is called the Tropic of Cancer and that S. of the equator the Tropic of Capricorn. Over these circles the sun is vertical when his declination is greatest, and they include that portion of the globe called the torrid zone, a zone about 47° wide, having the equator for a central line.

The regions lying between the Tropic of Cancer and the Tropic of Capricorn, or near them on either side, are called the tropics.

TROPIC BIRD, a popular name for any species of the genus *Phaëthon*. They are tropical sea birds, in habits and general appearance approaching gulls and terns, and resembling the latter in their mode of flight. Their powers of flight are great, and they are usually seen at considerable distances from the land, as they live almost entirely on the wing, and when they do not return to the distant shore to roost, rest on the surface of the water. They are about 30 inches long, of which the long tail feathers occupy about one-half. The general hue of the plumage is white; in two species, from the Atlantic Ocean, *P. ætherius* (or *candidus*) and *P. flavirostris*, the tail feathers are white; in the third species, *P. phœnicurus*, from the Pacific Ocean, they are red, and are highly valued by the natives of the South Seas as ornaments. Tropic birds nest in holes



TROPIC BIRD

in cliffs and on rocky islands, the female laying only one egg, and the male sitting in a hole by her side, both with heads inward.

TROPINE, $C_8H_{15}NO$; an organic base obtained by heating atropine with a saturated solution of baryta water, and precipitating the baryta with carbonic acid gas. It has a strong alkaline reaction, is soluble in water, alcohol, and ether, melts at 62°, and boils at 229°. From its ethereal solution it crystallizes in colorless anhydrous tables.

TROPPAU, the chief town and capital of the former Austrian Silesia; on the Oppa; 106 miles S. S. E. of Breslau. It is surrounded by fine gardens, replacing the old walls and intrenchments, and has three suburbs, six churches (one Evangelical), an old town hall (lately rebuilt in Gothic style), a large barrack, a higher gymnasium and realschule, a teachers' training college, a commercial school, and several benevolent institutions. Troppau manufactured, before the World War, cloth (chiefly military), machinery, beet sugar, beer, potash, soda-water, lucifers, spirits, liquors, and paper. Troppau was founded in the 13th century. From Oct. 20 to Dec. 20, 1820, a congress of representatives of the five great powers, afterward transferred to Laibach, met here to plan for suppressing revolutionary outbreaks in Italy. Pop. about 35,000.

TROPPO, in music, an Italian term for too much.

TROSSACHS, a romantic defile forming an approach to the W. Highlands of

Scotland; in Perthshire, about 8 miles W. of Callander; extends for about a mile between Lochs Ackray and Katrine. The pass, which winds between Ben A'an on the N. and Ben Venue on the S., is confined by lofty rugged precipices, feathered to their summits with birch, pine and other trees.

TROTSKY, LEON, one of the leaders of the Russian Bolsheviki. His real name was Leber Bronstein, and at the time of his accession to power in Russia, he was about 40 years old. From his early manhood he took part in Russian revolutionary movements and was frequently in prison as a revolutionist. From 1905 to 1912 he was in Siberia for participation in revolutionary plots. Following his release he went to Berlin where he established a paper. He was compelled to leave after the outbreak of the World War, and for a time lived in Switzerland. He then went to Paris, where he established a paper advocating peace. This was suppressed by the influence of the Russian Government, and Trotsky moved to Spain, where he was again arrested. Following his release, he removed to New York City, where he engaged in writing for Russian revolutionary papers. Following the overthrow off the Imperial régime in Russia, he returned to that country and at once took an active part in the establishment of the Soviet Government. From its beginning, he, with Nikolai Lenine, was the strongest figure and he continued with the official title of Commander of War to direct the more aggressive activities of the government. See BOLSHEVISM; RUSSIA; COUNCIL OF WORKINGMEN AND SOLDIERS.

TROTTING HORSE, a horse trained to trot at high speed without breaking into a gallop. Trotting horses are of two distinct races: (1) The Russian, which is Arabian on a Flemish stock, attaining high speed, but with bad knee action; (2) the American, which is probably both Barb and Arabian on an English stock. Some of the fastest English trotting horses can cover a mile in three minutes, while American trotters have done the same distance in a few seconds over two minutes. The American trotting horse has been constantly increasing in speed, and what a few years ago was considered a wonderful performance is now looked on as commonplace. The history of the rise of the trotting horse—especially from the time of "Rarus" down to the days of "Nancy Hanks"—presents a constantly lower record of the time required to trot a mile. The names of individual American trotters are known all over the world, and the prices paid for some of them seem almost fabulous. The record for several years after the advent of "Maud S," remained stationary, but since has been eclipsed several times. "Nancy Hanks" trotted a mile against time in two minutes and four seconds, harnessed to a pneumatic sulky weighing 62½ pounds, and accompanied by a running horse, on the regulation track, Terre Haute, Ind., Sept. 28, 1892. "Alix," in harness, trotted a mile against time in two minutes and three and three-fourths seconds, at Galesburg, Ill., Sept. 19, 1894. "Star Pointer," in harness, paced a mile against time in one minute and 59¼ seconds, at Readville, Mass., Aug. 28, 1897. "Macy" made 1 mile, 20 yards, in one minute, 40 seconds, at Washington Park, Chicago, July 2, 1898. "Firearm" made ¾ of a mile in one minute and 8¾ seconds at Morris Park, N. Y., Oct. 3, 1899. "Ethelbert" in 1900 made one record of 2¼ miles in 3 minutes, 49 seconds, and another record of 1¾ miles in 2 minutes, 58½ seconds; "Latson" made the same record as the last quoted, in 1901. "Blue Girl" made a record of 1 and 1-16 miles in one minute, 44¾ seconds May 23, 1901. "Uhlan" trotted one mile in one minute and 58 seconds in 1912.

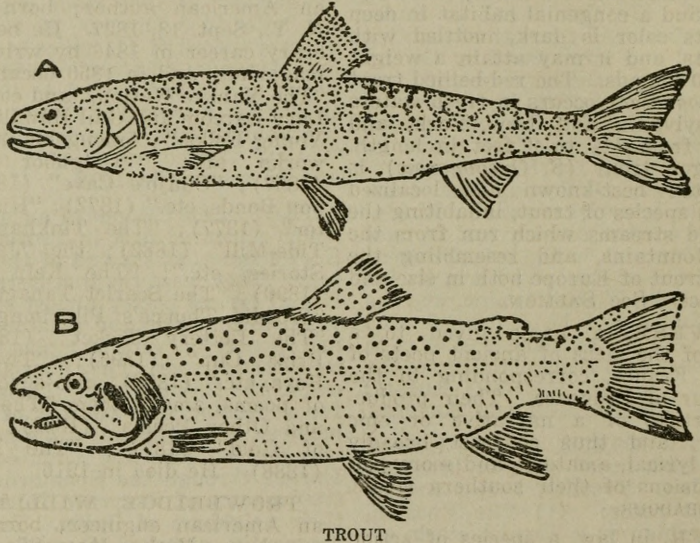
TROUBADOUR, one of a class of poets which appeared first in Provence, in the S. of France, at the end of the 11th century. They were the inventors of a species of lyrical poetry almost entirely devoted to romantic and amatory subjects, and generally very complicated in its meter and rhymes. They flourished till the end of the 13th century. There is reason for supposing that the art of the troubadours, generally called the gay science, was derived from the East, coming into Europe through the Spaniards, and the troubadours of Provence learning from their neighbors of Spain. Troubadours frequently attached themselves to the courts of kings and nobles, whom they praised or censured in their songs; but it was a rule that some lady was selected, and to her, under some general or fancy title, love songs, complaints, and other poems were addressed. The "love service" of the troubadours was often nothing more than mere artificial gallantry, but there are instances on record where it became something more earnest. The poems of the troubadours were not always confined to subjects of gallantry; sometimes they treated of the conditions of society, the evils of the times, the degeneracy of the clergy, and other subjects. See PROVENÇAL.

TROUT, a term applied generally to various species of fishes belonging to the

salmon family (*Salmonidæ*). The best-known species, and that which *par excellence* receives the name, is the *Salmo fario* or common trout, a fish which inhabits clear and running streams, and is mostly to be found tenanting some special nook from which it has to be warily drawn by the fly of the angler. The color of the trout is very characteristic. It is of a yellowish-brown color above, variegated with a dark reddish-brown hue, and marked by spots of a brilliant carmine along the lateral line. Below, a silvery white luster prevails, and the under part of the sides are a rich golden-yellow. Trout subsist largely on insects, worms, and the like fare. The bait which tempts it varies greatly from the fly to the minnow. A very peculiar and at the same time interesting fashion of capturing trout is in vogue among juvenile fishers, and is named "tickling."

Great Britain and of northern Europe at large.

A second species of trout is the salmon trout (*Salmo trutta*), which closely resembles the salmon in its general habits, especially in those relating to migration to the sea, and returning to the rivers to spawn. The common trout spawns about the end of October, the sexual difference between male and female then becoming markedly apparent in the elongation of the lower jaw of the former; the salmon trout spawning at about the same period. Certain species of trout are confined to certain lakes or streams, and are not found outside the bounds of these waters. In such cases special markings indicate the specific character of the fishes. Of such cases, a well-known example is the Loch Leven trout (*S. Levenensis*), which inhabits Loch Leven in Kinross-shire, a lake also tenanted by the common trout.



TROUT

A. Oquassa Trout. B. Rainbow Trout.

This process consists in feeling beneath the river banks for these fishes, in holes and like situations where they rest; when a fish is touched, the hand is outspread to prevent its escape, while, apparently, the fish, mesmerized by the action of the fingers on its sides, remains sufficiently quiet to permit of its sudden and speedy capture. The color and flesh of the trout appear to vary with the particular locality in which the fish is found. The average weight of the common trout is from three-fourths to one pound. Fishes which exceed one pound in weight may be regarded as exceptionally fine specimens. The trout is found in all the large streams and lakes of

From the latter the Loch Leven trout is distinguished by its larger size, and by the more pointed form of the pectoral fins. The tail fin is also more pointed than in the common trout, and the flesh is reddish, and wants the white or pink tint of the common trout's muscles. The pyloric cæca, or blind and pocket-like appendages attached to the hinder margin of the stomach of most fishes (and supposed to represent a pancreas or sweetbread), number from 60 to 80 in the Loch Leven trout, whereas in the common trout they are much fewer. A third species of trout is the Great Lake trout (*S. ferox*), common in some of the larger lakes of Great Britain and Ire-

land. It may attain a weight of 30 pounds or more, and has a prominent muzzle, and a square, truncated tail fin. The color is a dark brown, tinted with purple. This fish is a greedy feeder, devouring large numbers of smaller fishes, and is taken by night lines, or by trolling with strong tackle and a small trout for bait. The flesh is coarser than that of the preceding species. Like the Loch Leven trout the Gillaroo trout is limited in its distribution to Lough Neagh and other lakes in the N. of Ireland; and the lake trout (*S. Lemanus*) is confined to the Lake of Geneva.

Trout are plentifully found in American waters. The common brook trout (*Salmo fontinalis*) is almost identical, if not wholly so, with the common trout of the Old World. A second well-known American species is the *Salmo confinis*, or North American lake trout, which appears to find a congenial habitat in deep lakes. Its color is dark, mottled with gray spots, and it may attain a weight of over 50 pounds. The red-bellied trout (*S. erythogaster*) occurs in fresh waters in Pennsylvania and New York, and averages from 1½ to 2 feet in length. The Oregon trout (*S. Oregonensis*) is one of the best-known and localized American species of trout, inhabiting the rivers and streams which run from the Rocky Mountains, and resembling the common trout of Europe both in size and appearance. See SALMON.

TROUVÉRE, a name given to a member of the class of ancient poets of northern France, corresponding to the troubadour of Provence. Their productions partake of a narrative or epic character, and thus contrast broadly with the lyrical, amatory, and more polished effusions of their southern rivals. See TROUBADOUR.

TROVER, in law, a species of action on the case which is employed to try a disputed question of property in goods and chattels. The declaration in trover contained, previous to 1852, a formal allegation that the plaintiff lost, and the defendant found, the goods in question; but this legal fiction is now abolished, and the action is brought on a simple allegation that the defendant converted to his own use, or wrongfully deprived the plaintiff of the use and possession of the plaintiff's goods. In this action the plaintiff recovers damages equal to the value of the thing converted, but not the thing itself, which requires another form of action; detinue or replevin.

TROWBRIDGE, JOHN, an American scientist; born in Boston, Mass., in 1843; was graduated at the Lawrence Scientific School, Harvard University, in 1865; served as instructor there in 1866-1869. He was assistant Professor of Physics at the Massachusetts Institute of Technology in 1869-1870. He afterward founded a laboratory course in physics at Harvard University and was Professor of Experimental Physics in 1880-1888. In the latter year he accepted the chair of applied science in the same institution. In 1878 he was elected a member of the National Academy of Sciences and in 1883 was a delegate to the International Congress of Electricians. He was the author of "The New Physics"; "What is Electricity?" "Three Boys on an Electrical Boat"; "The Electrical Boy"; "Philip's Experiments, or Physical Science at Home"; and of many papers on physics and more especially on electricity.

TROWBRIDGE, JOHN TOWNSEND, an American author; born in Ogden, N. Y., Sept. 18, 1827. He began his literary career in 1846 by writing for the magazines, and in 1850 became editor of "The Yankee Nation," and co-editor with Lucy Larcom and Gail Hamilton, of "Our Young Folks." Among his most popular works are: "Neighbor Jackwood" (1857); "Cudjo's Cave" (1863); "Coupon Bonds, etc." (1872); "His Own Master" (1877); "The Tinkham Brothers' Tide-Mill" (1882); the "Jack Hazard Stories, etc."; "The Kelp Gatherers" (1890); "The Scarlet Tanager" (1891); "Woodie Thorpe's Pilgrimage" (1893); "The Lottery Ticket" (1895); "The Prize Cup" (1896); "Two Biddicut Boys, etc." (1898); also several volumes of poems, among them "The Vagabonds and Other Poems" (1869); "The Book of Gold" (1877); "The Lost Earl" (1888). He died in 1916.

TROWBRIDGE, WILLIAM PETIT, an American engineer; born near Birmingham, Mich., May 25, 1828; was graduated at the United States Military Academy in 1848; served on the United States Coast Survey in 1851-1853; conducted tidal and magnetic observations on the Pacific coast in 1853-1856; taught in the University of Michigan in 1856; superintended the erection of a self-registering magnetic observatory in Key West in 1860; and was employed in the preparation of minute descriptions of the harbors, inlets, and rivers of the S. coast and in the supervision of the distribution of supplies to the Union army in 1861-1865. He was chief engineer in the construction of the fortifications at Willett's Point, on Governor's Island, and at other points, and was also for several years Professor of Engineering at Yale and Columbia Universities. He

was an expert on bridge construction. Special recognition is due him for his design of the first cantilever bridge and for his invention of a high class coil boiler. He died in New Haven, Conn., Aug. 12, 1892.

TROY, a city of New York, and the county-seat of Rensselaer co. It is at the head of the navigation on the Hudson river, and is the terminus of the New York Barge Canal. It is on the Delaware and Hudson, the New York Central, the Rutland, and the Boston and Maine railroads. There is communication by river with New York and other cities. Troy is the distributing center for a large area. It is on the border of the Adirondack country and is placed in the center of a beautiful surrounding country. On the E. are the Berkshire Hills, S. is the valley of the Hudson, W. the valley of the Mohawk, and on the N. the Adirondack Mountains. All of this territory is easily accessible by trolley, steam roads, and improved State highways. Troy is connected by trolley lines with other cities, and is served by four interurban trolley systems. The suburbs of the city are unusually attractive. There are 8 public parks, which are well cared for. Troy is an important educational center. It is the seat of the Rensselaer Polytechnic Institute, the Emma Willard School for Girls, the Russell Sage College of Practical Arts, the Troy Conservatory of Music, the Emma Willard Conservatory of Music, the Mary Warren Free Institute, the La Salle Institute, and the Troy Business College. There are three high schools, a vocational school, 18 trade schools, and 16 kindergartens. There are also 10 parochial schools. The public library contains over 50,000 volumes. There were in 1921 75 churches, representing practically every denomination, There are four hospitals equipped with modern appliances. There are also many homes and asylums which provide for the treatment of persons needing assistance. The city maintains 7 public playgrounds.

Troy is an important manufacturing city. There were in 1920 32 wholesale houses and nearly 360 manufacturing concerns, employing more than 20,000 wage earners and producing annually products valued at over $60,000,000. More than 90 per cent. of the collars and cuffs made in the United States are manufactured in this city. It ranks second in the manufacture of brushes and is one of the most important manufacturing centers for engineering instruments. Other manufactures include valves, fire hydrants, merchant iron, pig iron, rivets, stoves, laundry machinery, ventilators, knitting machines, paper, paint, knit goods, shirts, tinware, marine engines, and anchor chains. The Watervliet Arsenal, across the river from Troy, is one of the largest and most important government plants in the country. There are six National banks, two trust companies, and three building and loan associations. The assessed valuation of real estate of the city, in 1920, was $55,700,114, with a grand total of $61,194,631. The city has many large retail establishments and is the shopping center for a district embracing more than 500,000 people.

History.—The site of the city was a part of the Van Rensselaer grant of 1629. Van der Heyden was one of the first settlers. He purchased a farm of 65 acres which in 1787 was laid out as a village. The name, Troy, was adopted in 1789, and the place was chartered as a city in 1816. It has been three times nearly destroyed by fire. In 1892 there were election riots there during which Robert Ross was murdered. One of his slayers, "Bat" Shea, was executed in 1896. Pop. (1910) 76,813; (1920) 72,013, including the sections annexed in 1901.

TROY, or **TROJA**, in classical legend and geography, the name of a district in the N. W. part of Mysia, in Asia Minor, and of a city situated in it. The latter was also called Ilium, and the former Troas, now the Troad. According to the account of Homer, the city was situated on ground rising above the plain formed by the rivers Scamander and Simoïs. On the S. E. was a hill, which was a spur of Mount Ida, and on which were the acropolis of the Trojans called Pergamum, the palaces of the king, and the temples of the gods. No such city as Troy, and no such people as the Trojans, were known in historic times. There have been various opinions respecting the site of the ancient city, and many efforts made to reconcile the present topography with the geographical statements made in the Homeric poems, the most important work in this line being the excavations of Schliemann in the Troad, at the mound of Hissarlik, long the traditional site of Troy.

Schliemann excavated Hissarlik, and came first on the remains of the Græco-Roman town, Novum Ilion, or New Troy; below it he dug out the ruins of four (or three) village settlements, one below another; below them he came on "the burnt city," and finally on the lowest, the oldest, the first city. This yielded, in the way of relics, principally pottery and stone implements. Metals were prac-

tically unknown to its inhabitants, who were plainly a settled pastoral and agricultural people. The interval that elapsed between the desertion and decay of this first city and the foundation of the next must have been long, for a layer of earth 1 foot 9 inches deep intervenes between the debris of the first and the second or "burnt city." The inhabitants of this city were, however, still in the stone age; but the number of gold and silver relics, and the presence of some copper implements, point to the approach of the bronze age, and seem to indicate a transition from the age of stone to that of metals. The two most important facts in connection with this city are the discovery of what Schliemann believed at first to be "Priam's Treasure" and the evidence that the city was destroyed in a conflagration. The treasure consists of big diadems of gold, chains and pendants of gold, golden earrings, all packed in a silver jar, bars of silver, 8,700 small gold rings, disks, buttons, and small bars of gold, silver vases, gold cups, electrum cups, silver daggers, etc. The whole of this treasure had been packed together and stowed away probably in a secret chamber constructed in the acropolis wall. Scholars are not agreed as to the accuracy of Schliemann's discoveries.

TROYES (trwä), the Augustobona, later Civitas Tricassium of the Romans, a town in France; capital of the department of Aube; on the Seine, 100 miles E. S. E. of Paris. The principal edifices are the cathedral, a fine Gothic building; the churches of St. Urbain and St. Madeleine; the town house; the prefecture, a public library, museum, etc. Being at the center of an important agricultural region, it has a large transit trade. The manufactures chiefly consist of cottons, woolens, hosiery, soap, artificial flowers, paper, gloves, etc. Pop. about 60,000.

TROY WEIGHT, a system of weights used for gold, silver, platinum, and precious stones. The Troy pound contains 12 ounces, 240 pennyweights, and 5,760 grains, being thus less than the avoirdupois pound, which contains 7,000 grains. The old apothecary's weight, which had the same value of pound as the Troy, but subdivided into 12 ounces, 96 drachms, and 288 scruples, was abolished in Great Britain and the new apothecary's weight made the same as the avoirdupois. The name Troy was given to the standard pound in 1495. The origin of the name is doubtful, some deriving it from "Troy Novant," the monkish name of London, others from Troyes in France.

TRUCE, a suspension of arms by agreement of the commanders of opposing armies; a temporary cessation of hostilities, either for negotiation or other purpose. The truce of God was a suspension of arms which occasionally took place in the Middle Ages, and was introduced by the Church in order to mitigate the evils of private war. This truce provided that private feuds should cease at least on the holidays from Thursday evening to Sunday evening each week, during the season of Advent and Lent, and on the octaves of the great festivals.

TRUCKEE RIVER, a river in California, forming the outlet of Lake Tahoe. It runs nearly N. and enters the State of Nevada, intersecting Washoe county and emptying into Pyramid Lake. It is nearly 125 miles long and abounds in trout.

TRUDEAU, EDWARD LIVINGSTON, an American physician, born in New York City, in 1848. He graduated from the College of Physicians and Surgeons, in 1871. For a short time he practiced in New York, and then, having contracted tuberculosis, he went to Saranac Lake. He received such benefit from the air and climate that he resolved that others should benefit, and, with the aid of others, opened the first American institution to attempt the open-air method of treatment for the disease. In 1894 he founded the Saranac Laboratory for the Study of Tuberculosis. His treatment was remarkably effective and won world-wide recognition. He developed it on a large scale and it continued to grow after his death. He wrote much on the subject of tuberculosis and, in 1916, the year following his death, his autobiography was published.

TRUE, ALFRED CHARLES, an American agricultural expert, born in Middletown, Conn., in 1853. He graduated from Wesleyan University in 1873, and took post-graduate studies at Harvard and elsewhere. He taught until 1888 in schools and colleges, becoming in the following year editor for the Statistical Department of Agriculture. From 1893 to 1915 he was the director of the Office of Experimental Statistics in the Department of Agriculture, and edited various publications. He had general supervision of experimental stations in States and Territories, and carried on investigations on agricultural education and other related subjects in Alaska, Porto Rico, Hawaii, and Guam. From 1915 he was director of the States Relations Service of the Department of Agriculture and had general supervision of the co-operative extension work in agriculture and home economics conducted by the Department of Agriculture and the

State agricultural colleges. At various times he was on the faculties of several universities and agricultural colleges. He was the author of monographs on agricultural experiment stations in the United States and agricultural education.

TRUE, CHARLES KITTRIDGE, an American educator; born in Portland, Me., Aug. 14, 1809. He was pastor of various Methodist churches, and subsequently Professor of Intellectual Philosophy at Wesleyan University (1849-1860). He was the author of "Elements of Logic" (1840); "Shawmut; or, The Settlement of Boston" (1845); "John Winthrop" (1875); "Sir Walter Raleigh" (1878); "Life and Times of John Knox" (1878); "Memoirs of John Howard" (1878); "The Thirty Years' War" (1879); "Heroes of Holland" (1882). He died in Brooklyn, N. Y., Jan. 20, 1878.

TRUE, FREDERICK WILLIAM, an American biologist; born in Middletown, Conn., July 8, 1858; was graduated at New York University in 1878 (LL. D., 1897); became connected with the government service in 1878; and was appointed expert special agent on fisheries for the 10th census, 1879. He next served as custodian of the collections of the United States Fish Commission at the Berlin Fisheries Exhibition in 1880. He was curator of the department of mammalia at the United States Museum in 1883-1892, and was executive curator in 1892-1897. In the latter year he was made head curator of the Department of Biology at the United States National Museum. During the exposition in Nashville in 1897, Omaha in 1898, and Buffalo in 1901, he was the representative of Smithsonian Institution. He was the author of "Review of the Family of Dephinidæ"; etc. He died in 1914.

TRUFFLE, a genus of fungi of the order *Tuberacei*, division *Ascomycetes*; globose, or nearly so; of a fleshy substance, with a distinct skin, the whole substance pervaded by a network of serpentine veins, which are the hymenium, and bear the spore-cases in minute cavities. The species are not numerous; they are very generally diffused in temperate parts of the world; they are subterranean, often found at the depth of a foot or more in the soil, usually near the roots of trees, or rarely living on the surface. Some of them are among the most highly valued or esculent fungi. They are said to have a stimulating aphrodisiacal quality. The common truffle (*T. æstivum*) is of a black color, and has a warty surface. It is the principal species sold in the English markets. It varies in size from that of a large plum to that of a large potato. On account of its agreeable flavor, it is used in the preparation of many dishes. It is common in central and southern Europe, chiefly in loose soils, in woods and pastures, as in the chestnut woods of France and Italy.

TRUJILLO, (trö-hēl'yo), (1) a town of Spain, the birthplace and burial place of Pizarro, in Cáceres province, 60 miles N. E. of Badajoz. It is built partly on a granite crag, and manufactures linen, leather, and pottery. Pop. about 12,000. (2) An episcopal city of Peru, capital of the department of Libertad, on a fertile plain near the sea-coast. It was founded by Pizarro in 1535, has walls that were raised in 1686 to keep out the filibusters, and contains a college, a theological seminary, and high school. Its ports are Huanchaco and Salaverry. Pop. about 15,000. (3) A port of Honduras, on the N. coast (bananas, hides, mahogany, rubber, and cattle). The town dates from 1524. Pop. about 2,500.

TRUMBULL, HENRY CLAY, an American editor; born in Stonington, Conn., June 8, 1831. He was army chaplain, 1862-1865; afterward secretary of the American Sunday-School Union, 1865-1872; and after 1875 editor of the "Sunday-School Times." He published many books, including "Army Sermons" (1864); "The Knightly Soldier" (1865); "A Useful Life," etc. (1866); "The Captured Scout" (1869); "Children in the Temple" (1869); "A Model Superintendent" (1880); "Kadesh-Barnea" (1884); "Teaching and Teachers" (1884); "The Blood Covenant" (1885); "Yale Lectures on the Sunday-School" (1888); "Hints on Child Training" (1890); "Friendship the Master Passion" (1891); "Studies in Oriental Social Life" (1894); "War Memories" (1898); "The Covenant of Salt" (1899); "Answers to Prayer" (1900); etc. He died in 1903.

TRUMBULL, JOHN, an American poet and lawyer; born in Waterbury, Conn., April 24, 1750. He wrote, with Timothy Dwight, a series of essays in the "Spectator" style, which first drew attention to his ability. In "The Progress of Dullness" (1772-1773) he satirized contemporary methods of education; but he won his greatest fame with "McFingal" (1775-1782), a satire on the loyalists of the Revolution time, written in Hudibrastic verse. Thirty pirated editions are said to have been sold; and some of its lines are still "familiar quotations" popularly credited to "Hudibras."

Later he was associated with Joel Barlow and others in the production of "The Anarchiad" (1786-1787). His "Poetical Works" were published at Hartford, Conn., in 1820. He died in Detroit, Mich., May 10, 1831.

TRUMBULL, JOHN, an American artist; born in Lebanon, Conn., June 6, 1756; grandson of the first Jonathan Trumbull; was graduated at Harvard College in 1773; studied painting in Boston; served in the Revolutionary War on the staffs of Generals Washington and Gates; and in 1780 went to England to become a pupil of Benjamin West, but was arrested on a charge of treason and forced to leave the country. On the conclusion of peace he returned to England and resumed his studies under West. In 1786 he produced his first historical picture, the "Battle of Bunker Hill"; which was soon followed by the "Death of Montgomery Before Quebec" and the well known "Sortie of the Garrison from Gibraltar." After serving for several years as a secretary to John Jay, the American minister to England, and as a commissioner to execute the seventh article of Jay's treaty, he returned to his profession. In 1817 he was employed by Congress to paint four pictures for the rotunda of the Capitol at Washington. For these works, which represented "The Declaration of Independence," the "Surrender of Burgoyne," the "Surrender of Cornwallis," and the "Resignation of Washington at Annapolis," he received $32,000. Subsequently he was for many years engaged in finishing former sketches and painting copies of the National pictures, many of which, together with portraits and several copies of old masters, 54 pictures in all, he gave to Yale College in consideration of an annuity of $1,000. He died in New York City, Nov. 10, 1843.

TRUMBULL, JONATHAN, an American patriot; born in Lebanon, Conn., Oct. 12, 1710; was graduated at Harvard in 1727; was successively judge, deputy-governor, and governor (1769-1783) of Connecticut; and took a very prominent part in forwarding the Revolutionary War. Washington placed great reliance on him, and frequently consulted him; to this habit, and his phrase, often repeated when in doubt, "Let us hear what Brother Jonathan says," has been traced the name which stands (though not so generally now as "Uncle Sam") for a personification of the United States as "John Bull" does for England. Trumbull died Aug. 17, 1785.

TRUMBULL, LYMAN, an American statesman; born in Colchester, Conn., Oct 12, 1813; removed to Belleville, Ill., in 1837; became secretary of state of Illinois in 1841; and justice of the Supreme Court of the State in 1848. In 1854 he was elected to Congress as a Democrat, and in 1855 was chosen United States senator. He joined the Republican party on the anti-slavery principle, in 1860, and supported Abraham Lincoln; was re-elected to the Senate; secured the passage of the Fourteenth Amendment; and was one of the Republicans who voted against the impeachment of Andrew Johnson. Later, he became a Democrat. He died in Chicago, Ill., June 25, 1896.

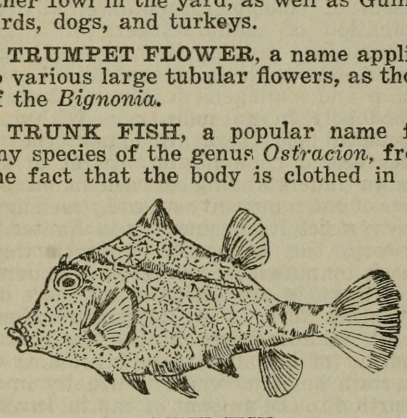
TRUMPET, in music, a metal wind instrument of bright and penetrating tone, formed of a single tube of brass or silver, curved into a convenient shape, with a mouthpiece at one end, the other having a bell. Its part is usually written in the key of C with the treble clef, though by means of crooks or lengthening pieces the sounds produced may be in various keys. The trumpet required for a piece is indicated at the commencement, as trumpet in B, C, D flat, E, F, or G. The modern orchestral or slide trumpet consists of a tube 66¾ inches in length and three-eighths of an inch in diameter. It is twice turned or curved, thus forming three lengths; the first and third lying close together, and the second about two inches apart. The slide is connected with the second curve. It is a double tube, five inches in length on each side, by which the length of the whole instrument can be extended. Trumpets with pistons or valves capable of producing every chromatic sound within their compass are sometimes used, but the tone is by no means to be compared with the true trumpet tone. Also, a stop of an organ having reed pipes tuned in unison with the open diapason. The octave trumpet or clarion stop is an octave higher.

TRUMPETER, in ichthyology, the *Latris hecateia*, one of the most important food fishes of the Southern Hemisphere. It ranges from 30 to 60 pounds in weight, and is considered by the colonists the best flavored of any of the fishes of New Zealand, Tasmania, and south Australia. Large numbers are smoked and sent into the interior. In ornithology, any species of the genus *Psophia*. They are South American birds, allied to the crane, inhabiting the forests, frequenting the ground in search of grain for food, and often betraying their presence by their loud call, whence both their popular and scientific names are derived. The best known species,

P. crepitans, is very beautiful. The breast is adorned with brilliant changing blue and purple feathers, with metallic luster; head and neck like velvet; wings and back gray, and belly black. They run with great swiftness, and are capable of domestication, attending their master in his walks with as much apparent affection as his dog. They have no spurs, but such is their high spirit and activity, that they browbeat every other fowl in the yard, as well as Guinea birds, dogs, and turkeys.

TRUMPET FLOWER, a name applied to various large tubular flowers, as those of the *Bignonia*.

TRUNK FISH, a popular name for any species of the genus *Ostracion*, from the fact that the body is clothed in an



TRUNK FISH

inflexible armor of hard plates, the tail, fins, and gill openings passing through holes in this coat of mail.

TRURO, a town of Nova Scotia, the county-seat of Colchester co. It is on the Canadian Pacific and Intercolonial railroads, and on the Bay of Fundy. It is the seat of the Provincial Normal College, the Nova Scotia College of Agriculture, and other educational institutions. Pop. about 7,000.

TRUSS, in architecture, an ornamented corbel, serving to support an entablature or balcony, or to conceal the ends of the beams which really support the structure; in the latter case it is frequently made of galvanized sheet iron. In carpentry, a frame to which rigidity is given by staying and bracing, so that its figure shall be incapable of alteration by the turning of the bars about their joints. The simplest frames are of wood, and of few parts. More imposing structures are more complicated, the parts being employed in resisting extension or compression. Composite trusses employ both wood and iron; in fact, few of any importance are destitute of bolts and tie rods. In the simplest form of a truss the tie beam is suspended by the king post from the apex of the angle formed by the meeting of the rafters. In the more complex form the tie beam is suspended by the queen posts from two points. In shipbuilding, a short piece of carved work fitted under the taffrail; chiefly used in small ships. Also, the iron hoop, stirrup, and clasp by which the middle of a lower yard is secured to the mast. It consists of a hoop on the mast, tightened by means of screws, whose open heads engage the eyes of a stirrup, which is swiveled to the hoop on the yard. In surgery, an instrument to keep hernia reduced, that is, to retain the intestines within the abdominal cavity. The essential feature is a spring or bandage resting on a pad, which is kept above the orifice of protusion. The pad is usually kept to its place by a spring which reaches around the body terminating opposite to the ruptured part. The spring is cushioned, and sometimes has pads to give it bearing on special parts.

TRUST, an arrangement by which property is handed to or vested in a person, in the trust or confidence that he will use and dispose of it for the benefit of another. In England, land was in early times frequently conveyed to persons in whom the owner had confidence that they might hold it to the use of other persons indicated by him. The use was turned into a legal estate by statute in 1535, but the equitable powers of the Chancery remained, and were freely used to enforce any trust, whether relating to land or to personal property. Trusts of land must be declared in writing, but this rule does not apply to trusts raised by implication or construction of law. Thus, if A purchases land with the money of B, he holds it as trustee for B, although there may be no written agreement between them. The person who holds property in trust is a trustee; the person for whose benefit he holds is called *cestui que trust* (he that has the benefit of the trust). In declaring a trust no special formula is necessary, but the intention of the party making it must be clear. Thus, in wills, a testator sometimes uses words which do not amount to an express trust, but speaks of his "wish and desire" or his "confidence," that the executor or trustee shall do certain things. These are called in the law precatory trusts; they are enforced if no uncertainty exists as to the purposes or mode of carrying out the trust. A trustee's is not a compulsory office, but gratuitous; but if he once accept he is not at liberty afterward to renounce, unless the trust deed contain a provision enabling him to do so, or the court for good reasons discharge him. A trustee cannot delegate the office to a

third person, but continues personally bound to do his duty. Where there are several trustees appointed, the office is considered joint, so that if one dies, the survivors continue to exercise the office. As a rule, all must join in doing any act; but if the trust is of a public nature a majority may bind the minority. Each trustee is liable only for his own acts or defaults, and this is so even though, for form's sake, he join his co-trustees in signing a receipt, if he can show that he never received the money in point of fact. When money lies in the hands of one trustee the others ought not to be satisfied with his mere statement that the money has been invested by him, but should see that it is actually done. Another rule is that a trustee is not allowed to make a gain of his office, and so jealous is an English court of this rule that trustees have sometimes been restrained by the court from shooting over the trust estate. A trustee is personally liable if he trade with the trust funds, or buy shares in a joint stock bank; for, even though the trust deed authorize this to be done, he will be liable to pay the debts of the trading concern, though far exceeding the amount of the trust funds. So, if a trustee is a solicitor, and does legal business for the estate, he will not be allowed to charge for his care and trouble, but at most will be allowed only the cost out of pocket. It is seldom that a trustee can get any benefit to himself from the trust estate. Formerly if *cestui que trust* died without heirs land held in trust belonged to the trustee, but the rule has been altered by statute, and the escheat is now to the State. It is the duty of a trustee to keep the trust funds safe and if they consist of moneys, then he ought to invest them in government bonds, and not let the money lie unproductive. He is not entitled to lend money on personal security, or in the shares of any private company; but he may invest in mortgages, unless he is forbidden by the deed or will. If there is no power to invest in mortgages, the trustee must invest in State, city, or government bonds, or in some security authorized by the orders of the Supreme Court. As a rule, trustees must pay interest whether they invest the funds or not (if they have had time to invest) to the *cestui que trust;* and they must account for all the profits they make with the trust funds whether rightly or wrongfully. If a trustee has grossly misconducted himself as to the trust funds he will be charged five per cent. interest. A trustee is entitled to be indemnified for all the reasonable expenses or outlays attending the execution of the trust, but he must in general bear the loss of any mistake as to the law; but if there is any peculiar difficulty in carrying out the trust, he is entitled to take the opinion of, or even to throw the chief management on the courts, as the only safe protection. When trustees are guilty of gross negligence, mismanagement, or misconduct, the court will remove them and appoint others.

Trusts, broadly speaking, and as a term of common acceptance, any combination of manufacturers of a given commodity, ranging from a verbal agreement among them, to centralized ownership and management, tending toward a monopoly in an industry. Within this general field there are many types and degrees of combination. First of these is an understanding between manufacturers of one commodity whereby each agrees to restrict its business to a limited territory, the agreement apportioning to each manufacturer a certain amount of territory, in proportion to the trade done. Another form is an agreement whereby each manufacturer agrees to limit the output of his manufacturing plants to a certain amount, which is usually in proportion to the amount of capital invested. A third form, or degree, of this type of "gentlemen's agreement," and most pernicious of all, is that by which all members of the ring agree to fix a standard price, by which all must abide, any change of price being made by a conference of representatives of all concerned. Such a pact, naturally, is only possible when practically all the manufacturers in the country of the commodity in question adhere to it, the outsiders being so few that they may be crushed by a temporary lowering of prices, entailing a loss which only the members of the trust are strong enough to sustain. It was this type of trust that was exposed by the Lockwood Investigation Committee in the building trades in New York, during the latter part of 1920, and the early months of 1921.

Higher types of trusts include two main forms: federated unions and centralized unions of manufacturers. The federated unions may again be divided into two types—trusts proper and holding combinations. The centralized union is a type by itself, and includes single ownership and management, under one corporation, involving a financial union and the purchase or sale of securities or physical assets. To create a trust proper the heads of the various firms meet, a trust deed is drawn up, similar to a corporate charter, which provides, first, that the common stock of the

members be exchanged for trust certificates and, second, that the trustees manage the several corporations in the manner they deem most conducive to the best interests of the holders of the trust certificates. Such a combination constitutes a permanent financial union.

The first trust created in the United States was the Standard Oil Company, through the remarkable genius of S. C. T. Dodd. Within the next ten years, trusts were also organized in the cotton, sugar, and whisky industries. As these and other similar combinations appeared, however, restrictive legislation was passed in the various States, with the exception of New Jersey, whose laws remained so accommodating that most combinations established their headquarters in that State.

The stockholding method was that which was most in practice during the earlier period of trust formation in this country. As an illustration, the American Sugar Company, known as the sugar trust, was formed by the corporation acquiring a majority interest in its rivals, in 1894. During the following ten years this method was widely practiced among the railroads. In 1900 a new and advanced step was taken, when James J. Hill organized the Northern Securities Company, which acquired possession of the Great Northern railroad companies and the Northern Pacific. Later suit was brought by the State of Minnesota to have this merger dissolved, the Supreme Court finally passing a decision that this form of trust was illegal.

The rapid growth of these various forms and types of corporations in the United States was recognized as a constantly growing menace to the social interests, which could not be met by the legislation of the individual States. The vast capital available to certain combinations made it possible to crush small competitors by economic oppression, without redress before the courts of the country. On the other hand, the creation of a monopoly made it possible for them to levy what amounted to heavy taxes on the consuming public in the form of arbitrary profits, unlimited by competition. By the pooling arrangements, already described, competing firms were transformed into partners in one gigantic concern that could restrain trade and control the market.

In 1890, when ten States had already enacted anti-trust legislation, without much effect, the popular demand became so strong that Congress was compelled to take action. On July 2 of that year the famous Sherman Anti-Trust Law was passed, which for the first time gave the Federal Government power to take legal action against combinations in any part of the country.

Though drawn up with care and debated at length, the new law could only declare those combinations illegal which were in "restraint of trade." Tremendous efforts were therefore made to amend the provisions of the law so as to render their application impotent. The best legal talent available was employed to have incorporated the phrase which would define a trust as enjoying a complete monopoly of the market for its particular commodity. The law was also attacked on the ground that it curtailed the fundamental right of free contract. The act having been passed, these same interpretations were put forth through test cases. Several of the lower Federal courts decided in favor of the corporate interests, but after a tedious series of litigations the Supreme Court finally decided that a complete monopoly need not necessarily be proven, and that the liberty to make contracts applied only to legal contracts. But in spite of the fact that several notable convictions were obtained under the Sherman law, in such cases as the Standard Oil Company and the Tobacco trust, both of which were ordered to dissolve into their former component parts, it soon became evident that this piece of Federal legislation was ineffectual. By means of gentlemen's agreements, dummy directors and interlocking directorates, the trusts continued to operate.

To remedy this condition and make the law really effective, supplementary legislation was passed by Congress, on October 15, 1914, known as the Clayton Anti-Trust Act. By some of its provisions a manufacturer was forbidden to sell goods to a merchant on the understanding that he should not be free to buy from others as well. Another provision forbids a corporation from selling to different dealers at different prices. With certain exceptions holding companies and interlocking directorates were forbidden. The most valuable feature of the law was the establishment of the Federal Trade Commission, which has the power to determine what constitutes unfair methods and acts "in restraint of trade." It also has the power to make special investigations, order hearings and to enforce its decisions through the Circuit Court of Appeals. It has been of real value in exposing to the public the methods of vicious combinations through the publicity attending its investigations, even though the facts made public do not come within the provisions of the law. The report of its investigation of the

packing industry during 1918 and 1919 created such intense public sentiment against the meat trust that the latter was compelled to offer an effective compromise with the Federal authorities, though there was substantial reason to doubt whether a case could have been made out against it.

Two important decisions were rendered in 1920 by the Supreme Court in connection with the prosecution of trusts. In both cases the decision was made by a vote of four to three, two members of the Court not taking part in the deliberations. That against the Reading Company was a complete victory for the Government, compelling the coal interests to be separated from the railroad interests of the corporation. The case against the packing companies was also an undoubted victory, though won by other than court proceedings. According to the compromise the trust agreed to sell all its holdings not connected with the actual meat and packing trade and furthermore agreed never to engage in retail distribution.

TRUXTUN, THOMAS, an American naval officer; born in Long Island, N. Y., Feb. 17, 1755; joined the navy in 1767. When the Revolutionary War began he was in command of the "Andrew Caldwell," a merchant vessel, in which he carried a cargo of powder to Philadelphia. During the same year his vessel was captured by the frigate "Argo." He was then made a lieutenant in the navy and assigned to the "Congress," the first American ship commissioned as privateer. In 1776 he captured several prizes in the West Indies, and the following year took command of the "Independence," with which he took a number of prizes, including one more heavily armed than his own vessel. Later he equipped the "Mars" with 20 guns and cruised the English channel, doing much damage to British merchant marine. In 1781 he was assigned to the "Commerce," with which he defeated a British vessel with 32 guns. In all of his engagements with the enemy he was uniformly victorious. In 1798, when the United States navy was organized, he was selected as one of its six captains, and was placed in command of the "Constellation," and was ordered to protect American commerce in the West Indies. In February, 1799, he fought a severe battle with the powerful French ship, "L'Insurgente" and captured her after killing 29 of her crew and wounding 44. In recognition of this service a number of London merchants forwarded him a plate valued at 600 guineas. In January, 1800, he defeated the French frigate "La Vengéance," and for this achievement received a gold medal and thanks from Congress. In 1802 he was assigned to command a fleet to participate in the war with Tripoli, and went to Norfolk to join the "Chesapeake." About the same time he requested the appointment of a captain for his flagship. His letter was taken to mean his resignation, which was accepted against his wishes. He was the author of "Remarks, Instructions and Examples Relating to Latitude and Longitude" (1794). He died in Philadelphia, Pa., May 5, 1822.

TRYON, SIR GEORGE, a British naval officer; born in 1832; entered the navy in 1848; was at Sebastopol; became captain in 1866, and admiral in 1884. He was commander-in-chief on the Australian station in 1884-1888, and in the Mediterranean from 1891 till the disastrous collision (June 22, 1893) off the coast of Syria, when his flagship, the "Victoria," by his mistaken order, collided, capsized, and sank with her commander and great part of her crew.

TRYON, WILLIAM, a British colonial governor; born in Ireland, about 1729; joined the British navy and as an officer did creditable service. Through the influence of the Earl of Hillsborough, a relative of whom he married, he was made lieutenant-governor of North Carolina in June, 1764, and became governor in July, 1765. He put down the revolt of the "Regulators" in that colony, and was exceedingly cruel to the prisoners. The assembly of North Carolina voted $15,000 with which a beautiful residence was erected for him in Newbern. In 1771 he was made governor of New York. The patriots detested him on account of his arbitrary rule and especially for the cruelty he manifested in the destruction of Fairfield, Danbury, and Norfolk, Conn., expeditions against which he personally conducted. He relinquished the office of governor in 1778, and returned to England. He was promoted Major-General in August, 1777, and Lieutenant-General in November, 1782. He died in London, England, Jan. 27, 1788.

TSARSKOE SELO ("imperial town"), a town of Russia, province of St. Petersburg, 18 miles S. of Petrograd. It contains eight churches and two palaces, formerly the principal summer residences of the imperial family. The larger of these, built by Elizabeth in 1744, and embellished at greater expense by Catherine II., is a noble building, though overladen with false ornament. It has a frontage of 782 feet, and contains a ball

room 141 feet long and 50 feet broad. In one of its wings is a marble gallery 270 feet long by 28 wide, with a noble Ionic colonnade adorned with bronze busts of the most famous men of antiquity. The great park, one of the most carefully planted in Europe, contains a Turkish kiosk, a Chinese hamlet with a pagoda, a bridge built of Siberian marble over a canal connecting two lakes, a marble statue of Count Orlof, and the artificial ruins of a Gothic castle, in the chapel of which stands the marble statue of Christ by Dannecker, erected in 1824 by Maria Feodorovna at a cost of 30,000 rubles. In the armory is a large collection of armor, weapons, dresses, and relics of historical persons, while the model farm contains Tyrolese, Swiss and Dutch cattle, besides buffaloes and bisons. N. W. of the town is Pulkowa, the central Russian observatory. Pop. about 20,000.

TSCHAIKOWSKY, PETER ILTITSH, a Russian composer; born in Wotkinsk, Russia, in 1840; was educated at the School of Jurisprudence in St. Petersburg; received an office in the Ministry of Justice in 1859; turned his attention to music in 1862; and studied in the Conservatoire of Music till 1865. He was Professor of the History of Music, Harmony, and Composition in the Conservatory of Moscow in 1866-1878, and afterward applied himself to composition. His works include the "Enchantress," "Vakula," "Opritchnik," and several ballets and operas, six symphonies, and many concertos, symphonic poems, suites, etc. He died in St. Petersburg, Nov. 7, 1893.

TSCHUDI, EGIDIUS, or, as he wrote himself, **GILG SCHUDI,** the father of Swiss history; born in Glarus in 1505, of a family of which several members were distinguished in war, politics and science. He studied under Glarean in Basel and Paris; was in 1533 and 1549 high baliff at Baden, and for some time a captain in the French service; afterward traveling much among the Swiss mountains in search of materials for his historical studies. He several times acted as a mediator in the religious disputes of his time, but himself continued a Roman Catholic. In 1558 he became "Landammann" of Glarus; in 1559 was envoy to the Kaiser Ferdinand I. The chief of his numerous historical works is the "Chronicon Helveticum," embracing the period 1000-1470. The dramatic description of this book Schiller declared to be "both homely and Herodotean, nay Homeric," and used amply in giving local color to his "Wilhelm Tell." Rilliet notes that it was Tschudi who first gave precision to the circumstances, dates and persons of the Tell legend. Many unpublished MSS. of Tschudi are preserved in the libraries of St. Gallen and Zürich. He died in Glarus, Feb. 28, 1572.

TSCHUDI, JOHANN JAKOB VON (tshö'dē), a Swiss naturalist; born in Glarus, Switzerland, July 25, 1818. He traveled extensively in South America in 1838-1843 and again in 1857-1861. He wrote: "The Kechua Language" (1853); "Peru: Sketches of Travel" (1846); "Peruvian Antiquities" (1851); "Travels in South America" (5 vols. 1866-1869). He died in Jakobshof in Lower Austria, Oct. 8, 1889.

TSECH, or CZECH, a branch of the Slavic race, inhabiting Moravia and Bohemia.

TSETSE, the native name of *Glossina morsitans,* a dipterous insect, slightly larger than the house fly, from Africa, ranging from 18°-24° S. latitude. It is brown, with four yellow transverse bars on the abdomen, beyond which the wings project considerably. The head is armed with a proboscis adapted for piercing the skin, and the fly lives by sucking



TSETSE FLY

blood. At first no effect is perceived, but in a few days after an ox has been bitten, the eyes and nose begin to run, the coat bristles, a swelling appears under the jaw, and sometimes at the navel, emaciation and flaccidity of the muscles ensue, followed by purging, staggering, in some cases madness, and finally death. On dissection the cellular tissue under the skin is found to be injected with air, as if a quantity of soap bubbles were scattered over it. See SLEEPING SICKNESS.

TUAMOTU ISLANDS, PAUMOTU, or LOW ARCHIPELAGO, an extensive group of islands in the Pacific, lying E. of the Society Islands and S. of the Marquesas; mostly under French protection. They export pearls, mother-of-pearl, trepang, etc. Pop. about 4,000.

TUAREGS, TUARICKS, or TAWAREK, a nomadic race of Berber origin inhabiting the Sahara between long. 5° W. and 13° E., and across its entire breadth. They are the finest of the Sahara races, being handsome and powerfully made, but are fierce and are perpetually at war among themselves. They profess Islamism, but are more influenced by pagan superstitions. Their women go unveiled, and take part in public affairs. No reliable estimate of their numbers can be formed. Tuaregs is a name of Arabic origin, and Imoshagh is the name by which the Tuaregs designate themselves. They appear to be a race dating from remote antiquity, and Barth identifies them with a people figured on the Egyptian monuments.

TUATERA, the native name of *Sphenodon punctatum*, a large lizard from New Zealand; olive sides and limbs with minute white specks, beneath yellowish; the spines of the nuchal and dorsal crests yellow, of the caudal brown; the scales of the back, head, tail and limbs small, granular, nearly uniform; with irregular folds in the skin, which are



TUATERA

fringed at the top with a series of rather larger scales; an oblique ridge of larger scales on each side of the base of the tail, and a few shorter longitudinal ridges of rather smaller ones on each side of the upper part of the tail. The tuateras are apparently carnivorous, and in captivity are fed on raw meat, living frogs, small lizards, earthworms, mealworms, snails, young birds, or mice. The tuatera is remarkable as being the only living reptile of the order *Rhynchosauria*, and it was in the tuatera that the parietal or unpaired eye was first observed.

TUBA, in music, a brass wind instrument, the lowest as to pitch in the orchestra; it has five cylinders, and its compass is four octaves. Also, a high pressure reed stop of eight foot pitch on an organ; called also tuba mirabilis, tuba major, tromba, or ophicleide.

TUBER, in botany, an underground fleshy stem or appendage to the root, being usually an oblong or roundish body, of annual duration, composed chiefly of cellular tissue with a great quantity of amylaceous matter, intended for the development of the stems or branches which are to spring from it, and of which the rudiments, in the form of buds, are irregularly distributed over its surface. Examples are seen in the potato, the Jerusalem artichoke, and arrowroot. Tubers are distinguished, according to their forms, into didymous (in pairs), palmate (hand-like), fasciculate, globular, oblong, etc.

TUBERCLE, a small tuber; a warty excrescence; in pathology, a growth usually taking the shape of minute round masses, and developing in the lungs, intestines, larynx, etc., of persons of scrofulous constitution. It is described by pathologists as being of two kinds, the gray or miliary, and the yellow or crude; but the latter is, strictly speaking, a secondary form of the former. Gray, or miliary tubercle, is "a grayish-white, translucent, non-vascular body, of firm consistence and well-defined spherical outline, usually about the size of a millet seed. Though in its earlier stage it is uniformly translucent, its central portions quickly become opaque and yellowish, owing to the retrograde metamorphosis of its component elements. In structure tubercle, like the other lymphomata, consists of lymphatic cells contained in the meshes of a very delicate reticulum. The cells are mostly round, or roundly oval, colorless, transparent, and slightly granular bodies, much resembling lymph corpuscles; and, like these, varying considerably in size."

TUBERCULIN, KOCH'S LYMPH, or PARATOLOID, a glycerin extract of the pure culture of the tubercle bacillus, first prepared by Robert Koch in the year 1890. It was originally hoped that it would prove of value in combating the disease by injecting it into the blood of the sufferer from tuberculosis, but for this purpose it has not met with much success and in some cases appears to have aggravated the disease. It has proved of value, however, in detecting the disease in both human beings and cattle. When injected into the healthy body, no reaction ensues, but when injected into the blood of a person or animal suffering from tuberculosis, feverish conditions are produced. It is commonly used in this way to detect tuberculous cows. In appearance it is a brownish liquid with a neutral reaction, soluble in water. Chemically, it consists of a solution of the ptomaines of the tubercle bacillus, together with coloring and extractive matters and mineral salts.

TUBERCULOSIS. See CONSUMPTION.

TUBEROSE (*Polianthus*), a genus of plants of the natural order *Liliaceæ*, having a funnel-shaped perianth, with six-parted limb, stamens inserted in the tube of the corolla, a superior capsule, and flat seeds. The common tuberose, *P. tuberosa*, has rounded bulbous roots; a cylindrical, upright, unbranched stem, three or four feet high; both root leaves and stem leaves sword-shaped, and very acute; flowers spiked and somewhat aggregated, large, pure white, the tube a little incurved. The plant grows well in the S. of Europe, but only bears the open air in northern climates during summer. The roots are a considerable article of export from southern to northern Europe. The plant is in high esteem for the beauty and fragrance of its flowers, the odor of which is most powerful after sunset, and has been known to cause headache and asphyxia in a room. The fading flowers emit, in certain states of the atmosphere, an electric light and sparks. The flowers yield an essential oil, which is used by perfumers. The native country of the tuberose is Mexico. The tuberose has been known in Europe for about three centuries. There are double and single flowered forms in cultivation, the former being the more highly esteemed. They are very extensively grown by British and American florists, who, by planting the roots successionally, manage to keep up a supply of flowers at all seasons. Of the double-flowered form there are several varieties, known in commerce as the double African, the double American, the double Italian, and the pearl, and the last named being smaller than the others.

TÜBINGEN, a town of Württemberg, Germany; 20 miles S. W. of Stuttgart, on a ridge between the Neckar and the Ammer. It is an old place, irregularly built, with steep and narrow streets in the main; but the suburbs, especially round about the new university and the railway station, have wide and spacious streets. Book printing, bookselling, making of chemicals and surgical and physical instruments, milling, dyeing, and trading in field produce, wine, hops, and fruits form the principal sources of employment, besides education. Tübingen has several Protestant churches (one, the Stiftskirche, dating from 1469-1483, and containing the graves of 12 princes of Württemberg) and one Catholic church. Its university, founded in 1477 by Eberhard im Bart, afterward first Duke of Württemberg, soon became a distinguished seat of learning, enjoyed for a time the presence of Reuchlin and Melanchthon, and continued to flourish long after the Reformation had firmly established itself. The Thirty Years' War, however, fatally checked its prosperity; and it was not till the early part of the 19th century that it began to reacquire a reputation. Under Baur it became celebrated as headquarters of the historico-philosophical theology known as the "Tübingen School," which has profoundly influenced the study of Church history. There is a Protestant seminary and a Catholic one, in which university lectures are given and theological students reside. Uhland long lived here. Pop. about 25,000.

TÜBINGEN SCHOOL, in Church history, the name given to two schools of theology whose chief representatives were connected with the University of Tübingen, either as professors or students.

The Old School—This was essentially orthodox. Its founder was Gottlob Christian Storr (1746-1805), appointed Professor of Philosophy at Tübingen in 1775 and Professor of Theology two years later. He accepted unreservedly the divine authority of the Scriptures, and sought by grammatical and historical exegesis to build up a system of theology, and laid especial emphasis on the evidential value of miracles. He came into conflict with Kant, and criticized his "Religion Within the Limits of Pure Reason" somewhat severely. Storr's theological system is contained in his "Theory of Christian Doctrine Drawn from the Scriptures" (1793). Among his immediate followers were the brothers Johann Friedrich (1759-1821) and Karl Christian Flatt (1772-1843), Friedrich Gottlieb Süsskind (1767-1829), and Ernst Gottlieb Bengel (1769-1826), a grandson of the great commentator.

The Modern School.—The principles of this school, founded by Ferdinand Christian Baur (1792-1860), also Professor of Theology at Tübingen, were in direct opposition to those of Storr. In 1835 Baur published his book on the pastoral epistles, in which he attempted to prove that they were the work of the 2d century; and in 1845 he denied the authenticity of all the epistles attributed to Paul, except that to the Galatians, I and II Corinthians, and Romans (with the exception of the last two chapters, the genuineness of which he called in question). He considered that Peter and John were Jewish in their views, only distinguished from their brethren by their faith in Christ as the promised Messiah. Paul maintained a doctrine that the crucifixion made Christ the Saviour of the world, and elaborated a theory of justification which to them was strange, and of religious freedom

which to them was abhorrent. For the sake of peace they were for a while silent, but the animosity broke out in the Apocalypse, which referred to St. Paul and his teachings when denouncing the Nicolaitanes. In 1844, in the "Theological Yearbook" (the organ of the school), and in a book on the Gospels, in 1847, Baur attempted to show that the fourth Gospel was not genuine. He maintained that it was written for the purpose of reconciling Judaistic and Pauline Christianity, and consequently belonged to the 2d century. Among the allies and followers of Baur were Zeller, who edited the "Theological Yearbook"; Schwegler, "Post-Apostolic Age"; Ritschl, "Gospel of Marcion and Gospel of Luke"; Kostlin, "Doctrinal System of John"; Hilgenfeld, and Holsten. As Baur grew older he modified his views greatly, and his "Christianity of the First Three Centuries" (1853) is a more conservative work than his previous writings. He asserts the pure morality of Christianity, while he denies its miracles. Since the death of Baur some of the Tübingen school have admitted the possibility of miracles as a necessary deduction from Theism, and the judgment concerning the fourth Gospel has been modified, and in some respect reversed. The "Life of Jesus" of Strauss (1832) was the outcome of the teachings of the new Tübingen school. The object of the book is to show that the Gospel narrative concerning Jesus is a philosophic myth—the expression of an idea in the form of an imaginary biography. But in the "New Life of Jesus," he says, "I have, mainly in consequence of Baur's hints, allowed more room than before to the hypothesis of conscious and intentional fiction." According to Prof. H. Schmidt, of Breslau, the historical and critical studies of Baur, though they led him to unsound conclusions, prepared the way for the brilliant achievements in the departments of Church history and doctrine of the present generation, and must ever be a starting point for the history of early Christianity.

TUCKER, GEORGE, an American educator; born in Bermuda in 1775; was graduated at William and Mary College in 1797; studied law and practiced in Lynchburg. He was a member of Congress in 1819-1825. For 20 years he was Professor of Moral Philosophy in the University of Virginia (1825-1845). He wrote for many journals and periodicals; was the author of "Letters on the Conspiracy of Slaves in Virginia" (1800); "Essays on Subjects of Taste," etc. (1822); "The Valley of the Shenandoah" (1824), a novel; "Principles of Rent, Wages and Profits" (1837); "Life of Thomas Jefferson" (1837); "History of the United States from their Colonization to 1841" (4 vols. 1856-1858); "Banks or No Banks" (1857); and "Essays, Moral and Philosophical" (1860). He died in Sherwood, Albemarle co., Va., April 10, 1861.

TUCKER, JOHN RANDOLPH, an American naval officer; born in Alexandria, Va., Jan. 31, 1812; joined the navy in 1826 and was promoted lieutenant in 1837. During the Mexican War he was executive officer of the bomb brig "Stromboli," and took part in the capture of Tabasco and other operations. He was promoted commander in 1855, and was assigned to the command of the receiving ship "Pennsylvania," stationed at Norfolk. He resigned from the United States navy in April, 1861, and became a commander in the navy of Virginia. In June of the same year he was placed in command of the steamer "Yorktown," which later was named the "Patrick Henry." With this vessel he took part in the various engagements in Hampton Roads, including the conflict between the "Monitor" and "Merrimac," on March 9, 1862. On the 13th following he was given command of the wooden squadron. He participated in the repulse of the National fleet at Drury's Bluff, and was soon after promoted captain and sent to Charleston, S. C., to command the naval forces as flag-officer. In February, 1865, after the surrender of Charleston, he organized the naval brigade at Drury's Bluff and commanded it till the Confederate army retreated from Richmond. During the retreat he served in the corps of General Ewell. In 1866 he took command of the Peruvian navy with the rank of rear-admiral. During the war between Peru, Chile and Spain, he had command of the combined squadrons of the two republics. He afterward settled in Petersburg, Va., where he died June 12, 1883.

TUCKER, WILLIAM JEWETT, an American educator; born in Griswold, Conn., July 13, 1839; was graduated at Dartmouth College in 1861, and at Andover Theological Seminary in 1866; was ordained in the Congregational Church and held several pastorates; was a professor in Andover Theological Seminary when he was called to the presidency of Dartmouth College in 1893. He retired in 1909. He wrote "Public Mindedness" (1910); "The Function of the Church in Modern Society" (1911), and other books.

TUCKERMAN, EDWARD, an American botanist; born in Boston, Mass.,

Dec. 7, 1817; was graduated at Union College in 1837 and at the Harvard Law School in 1839; studied for several years in Europe; returning to the United States in 1842 he accompanied Asa Gray to the White Mountains on a botanical expedition; was instructor in history at Amherst College in 1854-1873 and Professor of Botany there in 1858-1886. He was the foremost authority on lichenology in the United States. His publications include: "Genera Lichenum: An Arrangement of North American Lichens" (1872); "A Catalogue of Plants Growing Without Cultivation Within Thirty Miles of Amherst College" (1882); and "A Synopsis of the North American Lichens" (1882). He died in Amherst, Mass., March 15, 1886.

TUCSON, a city and county-seat of Pima co., Ariz.; on the Santa Cruz river, and on the Southern Pacific and the El Paso and Southwestern railroads; 250 miles E. of Yuma. Here are the University of Arizona, the Institute of St. Joseph, a high school, several libraries, court house, hospital, convent, National banks, and daily and weekly newspapers. It is in the heart of a large farming, stock-raising and mining section; has a valuable trade in hides, wool, precious metals. The place was first settled by Jesuit missionaries in 1760. Prior to that year it had been an Indian town. In 1867-1877 it was the capital of the territory of Arizona. The United States Signal Station here is 2,404 feet above sea-level. Pop. (1910) 13,193; (1920) 20,292.

TUCUM, a species of palm *Astrocaryum vulgare*, of great importance to the Brazilian Indians, who make cordage, bowstrings, fishing nets, etc., from the fine durable fiber consisting of the epidermis of its unexpanded leaves. The name is also given to the fiber or thread, and to an oil obtained from the plant.

TUCUMAN, a city and capital of a province of the same name in the Argentine Republic; on the Rio Sali, 3 miles from the mountains and 723 miles N. W. of Buenos Ayres, contains some handsome public and private buildings, a normal school, and several saw and flour mills and breweries, and manufactures sugar, leather, and brandy. In the neighborhood are orange groves, sugar plantations, and distilleries. Tucuman was founded in 1564; and here in 1812 Belgrano defeated the Spanish forces, and in 1816 a congress of deputies from the various provinces proclaimed the independence of the La Plata states. Pop. about 100,000. The area of the province is 10,422 square miles; pop. about 350,000.

TUDOR, the name of one of the royal families of England allied to the race of Plantagenets. The line embraced five sovereigns, and commenced in 1485 with Henry Tudor, Earl of Richmond, the grandson of Sir Owen Tudor, a Welsh knight of distinction, by his wife, the widow of Henry V., and who, after the battle of Bosworth Field, was proclaimed king by the title of Henry VII.; from him the crown descended to his son Henry VIII., whose son Edward VI. succeeded, and after him his two sisters, Mary and Elizabeth; the Tudor dynasty expiring with the death of the latter in 1603, the house of Stuart succeeding.

TUDOR STYLE, in architecture, a term applied to the Perpendicular style, from the fact that it attained its greatest development under Henry VII., the first of the Tudor line. The chapel which that monarch erected at Westminster is a famous specimen of this style. The term is applied specifically to late Perpendicular work. There are three phases of, or developments from, the Perpendicular:

(1) The Early Tudor, from the reign of Edward IV. to that of Henry VII. inclusive. Of this style there are no perfect buildings, and only few traces remaining. The Palace of Shene, built by Henry VII., has totally disappeared; but, according to the Survey of 1649, it abounded with bay windows of capricious design, with rectangular and semicircular projections, and was adorned with many octagonal towers, surmounted with bulbous cupolas of the same plan, having their angles enriched with crockets.

(2) Tudor, in vogue during the reign of Henry VIII. The plan of the larger mansions of this period was quadrangular, comprising an inner and base court, between which stood the gate house. On the side of the inner court facing the entrance were the great chamber, or room of assembly, the hall, the chapel, the gallery for amusements, on an upper story, running the whole length of the principal side of the quadrangle, and the summer and winter parlors. The materials were either brick or stone, sometimes both combined. Molded brickwork and terra-cotta were also employed for decorative purposes. Among the more striking peculiarities were the gate houses, the numerous turrets and ornamental chimneys, the large and beautiful bay and oriel windows, hammer beam roofs, and paneled wainscoting round the apartments.

(3) Late Tudor, or Elizabethan.

TUFA, a name given to a light, porous, calcareous stone, sometimes having the aspect of a sandstone, at others earthy and inclosing the decomposed remains of vegetable substances; composition, a carbonate of lime; deposited by springs, rivers, and heated waters which have traversed calcareous rocks; sometimes confounded with tuff which is the term specifically applied to a fragmentary deposit of a volcanic nature of composed heterogeneous materials.

TUFTS COLLEGE, a coeducational institution in Medford, Mass.; founded in 1852 under the auspices of the Universalist Church; reported at the close of 1919: Professors and instructors, 261; students, 1,687; president, H. C. Bumpus, Ph. D.

TUILERIES (twēl-rēz), the residence of the French monarchs; on the right bank of the Seine, in Paris. Catharine de Medici, wife of Henry II., began the building (1564); Henry VI. extended it, and founded the old gallery (1600); and Louis XIV. enlarged it (1654), and completed that gallery. The side toward the Louvre consisted of five pavilions and four ranges of buildings; the other side had only three pavilions. During the revolution of 1830 the palace was sacked. It was restored by Louis Philippe to its former splendor, but in 1848 it was again pillaged. The Tuileries then became a hospital for wounded soldiers, a picture gallery, and the home of Louis Napoleon in 1851. On May 23, 1871, it was almost totally destroyed by fire (the work of the communists), and the remaining portions were removed in the year 1883. The right wing alone escaped destruction.

TULA, an ancient and important manufacturing town of central Russia, capital of a province of the same name on the Upa, an affluent of the Oka, 110 miles S. of Moscow. Its churches, its arsenal, museum and government offices, and the ancient Kreml are the principal buildings. Before the World War the principal industries were in iron and steel goods, especially the firearms of the great imperial gun factory or private workshops. The Russian army was largely supplied with muskets and small arms from the works of this town. Cutlery, locks, samovars or tea urns, mathematical instruments, harmoniums, and bells were also made in great perfection; the niello work of Tula was famous; and dyeing, tallow melting, and the making of soap, candles, sealing wax, leather, silk, platinum ware, and jewelry was carried on. Pop. (1913) about 140,000.

TULANE, PAUL, an American philanthropist; born near Princeton, N. J., in May, 1801, son of a French immigrant. He received a common school education, and in 1818 he went to New Orleans, opened a store for general merchandise, and by 1828 he had amassed a fortune of over $150,000. This business he continued to carry on for nearly 40 years, engaging at the same time in cotton and real estate speculations, and in 1857 he retired with a large fortune. About this time he bought the Stockton place at Princeton, where he subsequently resided. For many years he gave liberally to the charitable institutions of Princeton and New Orleans. In 1822 he gave to the city of New Orleans real estate, which with subsequent gifts aggregated $1,100,000, intending to add about $1,000,000 to the amount, but dying intestate, it fell to his heirs. This gift was used to found TULANE UNIVERSITY (*q. v.*). He died near Princeton, N. J., March 27, 1887.

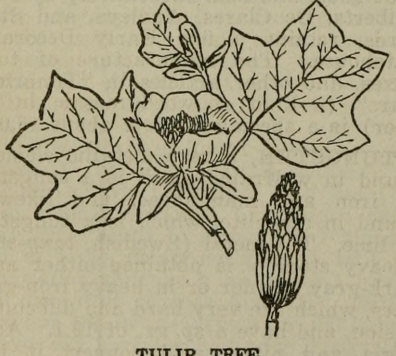
TULANE UNIVERSITY OF LOUISIANA, an institution for higher education, organized in 1884, at New Orleans, when the existing University of Louisiana was placed in the care of the administration of the Tulane Educational Fund. It was established largely through gifts of PAUL TULANE (*q. v.*). The university includes the Graduate Department, College of Arts and Sciences, College of Technology, and other professional schools. In 1919 there were 348 instructors and 2,908 students. President, A. B. Dinwiddie, LL. D.

TULIP, a genus of bulbous *Liliaceæ*, with usually solitary campanulate flowers of six free segments, stamens hypogynous, filaments short, anthers fixed by the base, mobile, linear, bursting inward; ovary three-cornered; stigma sessile with three radiating lobes; capsule erect, coriaceous. The genus is restricted to the Old World, extending from western Europe to Japan and the Himalayas; there are about 45 species, of which one is found in Great Britain. The common garden tulip (*T. Gesneriana*) has been cultivated away from its native country of southern Russia and Armenia for upward of three centuries. The first description given of it is by Conrad Gesner, in a memoir published in 1561. He had seen it in bloom in April, 1559, at Augsburg, in the garden of Herwart, who had received the seeds from Byzantium—probably from Dr. Busbecq, who knew the plant as grown by the Turks. It spread rapidly and appeared in most of the botanical books of the second half of the 16th century.

Into the Netherlands it was introduced in 1571, into England in 1577 (by James Garret), and into France by Peiresc, who cultivated it in 1610 at Aix, having received it from Tournay.

The taste for the tulip has since increased and their bulbs have become an article of commerce; it was carried to a ridiculous extent, and the tulip mania reached its height in Holland from 1634 to 1637. To develop all the beauty of form and color of which the tulip is susceptible requires the greatest care in its cultivation. From seed new varieties are raised, the seedlings blossoming at four to seven years. Hundreds of varieties have been established from time to time, which range under four groups—bizarres, byblœmens, roses, and selfs. The first have a yellow ground marked with purple or scarlet; the second a white ground variegated with violet or purple of various shades; the third are marked with rose, scarlet, or crimson on a white ground; and the fourth or plain-colored tulip have a white or yellow ground without any marks. The first three of these families are again divided into feathered and flamed according as the intermingled colors are in narrow or broad stripes. Various other species of *Tulipa* are now represented in all good collections of bulbous plants, and the early-flowering fragrant *T. suaveolens* is often seen in window culture. The yellow-flowered *T. sylvestris*, is common in Europe, and in Siberia its bulbs are eaten. *Tulipa* is derived from the Turkish word *tulipan*, a "turban," the rich and varied flowers resembling an inverted cap.

TULIP TREE, the *Liriodendron tulipifera*, one of the most magnificent forest trees of temperate North America; attaining in favorable situations a height of 100-190 feet, with a straight, clear trunk. It is the only species of the genus—which belongs to the Magnolia family—and may be recognized by its large three-lobed leaves, with the middle lobe cut square at the end, and large solitary tulip-like flowers having greenish sepals, and petals variegated with yellow and orange. The wood is highly esteemed, uniting lightness with strength and durability. It is of a pale-yellow color, fine-grained, compact, is easily worked, takes a good polish, and is therefore much used by house and bridge constructors, by cabinet-makers, coach-builders, implement-makers, etc., and by the Indians for canoes. The bark is officinal in the secondary list of the "United States Pharmacopœia" as a stimulant, tonic, and diaphoretic. The noble appearance of the tree led to its introduction over 200 years ago into Europe, where it is appreciated as a great ornament for pleasure grounds, etc. It is found from Vermont to Michigan and S. to Florida and Mississippi.



TULIP TREE

TULLE, a town in the department of Corrèze, France; on the Corrèze; 16 miles N. E. of Brive. It is an ill-built but finely situated town with a much-admired cathedral presenting a mixture of the Gothic and Classical styles. The Maison Sage and a square tower attributed to the Romans are the other buildings of note. Tulle has manufactures of arms, leather, lace (*Point de Tulle*), etc., and carries on a trade in iron and agricultural products. Some say it takes its name from a Roman fort called Tutela; more probably it first sprang up in the 14th century round a monastery. Pop. about 17,000.

TULLIUS, SERVIUS, the sixth legendary king of Rome, the son of a slave in the house of Tarquinius Pricus, and made king on his death by the arts of his queen, Tanaquil.

TULLOCH, JOHN, a Scotch theologian; born near Bridge of Earn, Perthshire, June 1, 1823, studied at the University of St. Andrews; and in 1844 was licensed as a preacher in the Church of Scotland. After holding for some years a charge in Dundee, he was in 1849 presented to the parish of Kettins in Forfarshire, and in 1854, on the death of Dr. Haldane, was appointed Principal of St. Mary's College, University of St. Andrews. He first attracted notice as a writer in the "British Quarterly" and "North British Review." In 1855 he obtained the second Burnett prize (£600) on the "Being and Attributes of God," and his essay was published under the title "Theism." The most important of his works are "Leaders of the Reformation" (1859); "English Puritanism and Its Leaders" (1861); "Beginning Life,

Chapters for Young Men" (1861); "The Christ of the Gospels, and the Christ of Modern Criticism" (1864); "Rational Theology and Christian Philosophy in the Seventeenth Century" (2 vols. 1872); "Religion and Theology, a Sermon for the Times" (1875); "Facts of Religion and of Life" (Sermons) (1876); and "Pascal" (1878). He died at Torquay, Feb. 13, 1886.

TULLUS HOSTILIUS, the third mythical king of Rome, and successor of Numa. His reign was a series of wars with Alba, the Veii, and the Sabines. The legend of the famous combat between the Horatii and Curiatii forms part of the story of the Alban war.

TULSA CITY, the county-seat of Tulsa co., Okla., about 95 miles northeast of Oklahoma City, on the Atchison, Topeka and Sante Fe, the Midland Valley, the Missouri, Kansas and Texas, the St. Louis and San Francisco, and the Tulsa and Sand Springs railroads. There are a high school, a Carnegie library, and handsome parks and boulevards. It is the seat of the Henry Kendall College. Natural gas, coal, and crude oil are found in vast abundance in the vicinity, and the city has become the center of a very prosperous oil producing region. There are also manufactures of brick and tile, sewer pipes, cotton-seed oil, glass, engines, pumps, and other machinery and tools, etc. Oil refining, coal mining, and wheat milling are also carried on extensively. Pop. (1910) 18,182; (1920) 72,075.

TUMOR, in surgery, any morbid parasitic growth, generally, though not always, attended by swelling. Tumors are primarily divided into two classes, the first innocent, including non-malignant, solid, benign, or sarcomatous, and the second malignant growths. Tumors of the first type occur in comparatively few tissues, and do not alter the adjacent parts unless the tumor produces pressure and partial inflammation; they have no tendency to ulcerate or slough, and, if extirpated by a surgical operation, they do not grow again. They vary considerably in structure, being fatty, cellular, fibrous, fibroid or tendonous, encysted, vascular, cartilaginous, osseous, or fibro-cartilaginous. Fatty and cartilaginous tumors often reach a size so large that they weigh many pounds. They should be excised while they are small. A tumor of the second type, on the contrary, may arise in almost any part of the body, though some parts are more liable than others to attacks. They tend to propagate their morbid action to the adjacent parts, or, by means of the blood, even to spots remote from their formative seat; they ulcerate or slough, and, when extirpated by surgical operation, grow again, either at the original or some other place. The cancer and tubercle are leading types of malignant tumors. A third type of tumor, the semi-malignant, is intermediate between the first two, and includes some forms of sarcomic and of melanotic tumor, the painful subcutaneous tumor or tubercle, nævi, polypi, etc. Melanosis is commoner in horses than in the human subject, and chiefly in white or gray horses. Various tumors are inter-thoracic, affecting the heart, the lungs, etc. There are also tumors of the brain, of the liver, the rectum, etc.; and in women the uterus and the vagina are specially liable to be affected with tumor.

TUMULTY, JOSEPH PATRICK, an American public official, born in Jersey City, N. J., May 5, 1879; educated at St. Peter's College, Jersey City, and after studying law was admitted to the New Jersey bar, in 1902. From 1907 to 1910 he was a member of the New Jersey Assembly. In 1910 he was appointed private secretary to Woodrow Wilson, then governor of New Jersey. In 1912 he was appointed secretary of the Supreme Court of New Jersey. After Governor Wilson's election to the Presidency of the United States he was appointed secretary to the President in 1913, serving throughout both terms of President Wilson.

TUNBRIDGE, or **TONBRIDGE**, a market-town of Kent, England; 29½ miles S. E. of London; on the Medway, which here divides into six streams, one of them called the Tun. A castle, originally Norman, but largely rebuilt in 1280-1300, and held successively by Fitz-Gilberts, De Clares, Audleys, and Staffords, retains a fine Early Decorated gatehouse. The manufacture of toys, boxes, and other articles in "Tunbridge ware" (a kind of wood mosaic in veneer) is a specialty. Pop. about 15,000.

TUNGSTEN, a rare metallic element, found in wolfram, which is a tungstate of iron and manganese, and likewise found in scheelite, which is a tungstate of lime. The metal (Swedish, *tung-sten*, "heavy stone") is obtained either as a dark-gray powder or in heavy iron-gray bars, which are very hard and difficult of fusion, and have a sp. gr. of 19.1. Aqua regia and nitric acid convert it into tungstic acid. When 10 parts of this metal are alloyed with 90 of steel a mass of extraordinary hardness is obtained. Tungsten forms two compounds with oxygen—viz., a binoxide, WO_2, which is

obtained in the form of a brown powder by heating tungstic acid to low redness in a current of hydrogen, and which does not form salts with acids; and an acid oxide, known as tungstic anhydride, WO_3. Various tungstates have been formed and examined. Of these the most important is the tungstate of soda, which answers admirably as a means of preventing muslin, etc., from bursting out in a flame when brought in contact with fire.

TUNGSTITE, a mineral occurring mostly as an earthy incrustation, but has been found in distinct cubic crystals at St. Leonard, near Limoges, France. Color, bright yellow or yellow-green. Composition: Oxygen, 20.7; tungsten, 79.3=100, with the formula WO_3. Called also tungstic acid and tungstic ocher.

TUNIC, in classical antiquities, a very ancient form of garment in constant use among the Greeks and ultimately adopted by the Romans. The Roman tunic was a sort of shirt worn under the toga, and buckled round the waist by a girdle. It reached an inch or two below the knees, and the sleeves were so short that they merely covered the shoulders; for though tunics hanging down to the ankles (*tunicæ talares*), and with sleeves extending to the wrists and terminating in fringes (*tunicatæ manicatæ et fimbriatæ*) were not unknown toward the close of the republic, they were always regarded as indications of effeminate foppery.

TUNING, the correct adjustment of the sounds of a musical instrument. Such instruments as the flute and horn are tuned without any difficulty, as, if the pitch is altered by accident, it affects every note, and may easily be rectified by varying the length of the pipe. The notes of the organ and pianoforte, however, are unconnected and independent, and require careful adjustment from time to time. Stringed instruments, such as the violin and harp, require tuning on every occasion on which they are used.

TUNING FORK, an instrument of steel, consisting of two prongs, branching from a short handle, which, when set in vibration, gives a musical note. It was invented by John Shore, in 1711. Though the pitch of forks varies slightly with changes of temperature, or by rust, etc., they are the most accurate means of determining pitch. They are capable of being made of any pitch within certain limits, but those most commonly used are the notes A and C, giving the sounds represented by the second and third spaces in the treble stave. The vibration number of the note C varies from 518 (French diapason-normal) and 528 (Scheibler-medium) to 540 and 544 (Philharmonic).

TUNIS a country of north Africa, now a French protectorate; bounded on the N. and N. E. by the Mediterranean, on the S. E. by Tripoli, and on the W. and S. W. by Algeria; area, estimated at 51,000 square miles; pop. about 1,900,000. The coast line presents three indentations, forming the Bay of Tunis on the N., and those of Hammamet and Cabes or the Lesser Syrtis on the E. The N. W. portion of the country is traversed by the Atlas Mountains, which on their lower slopes have many fertile tracts, partly under culture. Between these mountains and the Gulf of Hammamet on the E. stretches the extensive plain or plateau of Kairwan. The only river of any consequence is the Mejerdah. In 1900 there were 883 miles of railway, of which 866 belong to the state.

Agriculture is very much neglected; the principal crops are wheat, barley, and maize; olive plantations are numerous, while tobacco is largely, and cotton, indigo, saffron, and opium partially, grown. On several parts of the coast the fisheries, including that of coral, are valuable. The manufactures consist chiefly of woolen fabrics, soap, dyed skins, and ordinary and morocco leather. The inhabitants consist of a mixture of Moors and Arabs, along with Berbers, here called Kroumirs, occupying the elevated tract N. of the valley of Mejerdah.

In ancient times Tunis belonged to the Carthaginians, afterward formed part of the Roman province of Africa, was subdued about 675 by the Arabs, became a powerful state under independent rulers in the 13th century, and in 1575 was incorporated with the Ottoman empire. In the spring of 1881 the French invaded Tunis, in order to punish the turbulence of the Kroumirs, and the French minister resident is now the virtual ruler of the country. Under French administration the Tunisian debt has been consolidated, commerce has increased, the means of transit have been improved, and a number of primary schools established. The exports in 1918 amounted to £5,181,728, and imports to £8,297,718.

TUNIS, a city and capital of the protectorate of the same name; situated at the head of a salt lake, nowhere more than 6 feet deep, which communicates by a narrow channel with the Gulf of Tunis, an inlet 30 miles long. At the outlet of the lake is Goletta, the port of Tunis, whose harbor is a roadstead with good anchorage, and is sheltered from the N. Goletta is connected by railway with Tunis, which is a walled, fortified, and straggling city, whose winding streets

are now paved. The whole town has been built of materials taken from the ruins of Carthage, 13 miles N. E. The bazaars of Tunis are good, and some of the mosques are splendid edifices, but Europeans are jealously excluded from them. The Bey's palace is a modern building in the Saracenic style of architecture, internally decorated with great magnificence, but with little taste. The city has many schools and colleges, French and Jewish, and in the Great Mosque is also a Mohammedan college. Tunis has important manufactures of woolen, linen, and silk goods (which are exported to all the Mohammedan countries bordering on the Mediterranean), morocco leather, olive oil, soap, and perfumes. A canal opened in 1893 renders Tunis directly accessible to ocean-going vessels. Pop. about 200,000.

TUNNEL, in engineering, a horizontal or slightly inclined gallery beneath the surface of the ground; generally used for an aqueduct or for the passage of a railway, roadway, or canal. In the construction of railroads it is frequently necessary to pierce the hills, so as to preserve a line of road as nearly level as practicable. The method of proceeding with tunneling depends mainly upon the kind of material to be excavated. This having been generally ascertained by borings and trial shafts, the work is commenced by sinking the working shafts, which must be sufficiently capacious to admit readily of lowering men and materials, raising the material excavated, fixing pumps, and also for starting the heading of the intended tunnel when the required depth is reached. Besides the trial and working shafts, air shafts are sunk for the purpose of effecting ventilation in the works below. Tunnels when not driven through solid rock have usually an arched roof, and are lined with brickwork or masonry. In mining, a level passage driven across the measures or at right angles to the veins which it is its object to reach. Thus distinguished from the drift or gangway which is led along the vein when reached by the tunnel.

The Great Divide Tunnel.—A notable engineering feat was accomplished in 1893 in the completion of the boring of the Busk-Ivanhoe railway tunnel under the continental divide of the Rocky Mountains at Hagerman Pass, Col. The tunnel is almost two miles long—9,393 feet—and is through solid gray granite. It took three years and 20 days, of 20 hours' work each day, to make the excavation. It is 10,800 feet above sea-level, through the top ridge of the continent. The water draining from the one side of the mountain, under which it is driven, runs to the Atlantic Ocean, and from the other to the Pacific. Its construction cost $1,000,000 and 20 human lives. The tunnel substitutes two miles of track for 10 and does away with one of the most expensive railway climbs in the world. Among more recent tunnels are those under the Hudson and East rivers in New York City.

TUNNY, a member of the mackerel family, or *Scombridæ*; with somewhat the appearance of gigantic mackerel. There are several genera and species. The common tunny (*Thynnus vulgaris* of Cuvier, *Orcynus thynnus* of Gunther) is the *thynnus* of the ancients. It is a large fish, reaching nine feet in length, and 1,000 pounds in weight. It occasionally occurs on the British coasts, but is particularly abundant in the Mediterranean. It has a large mouth with small teeth, two dorsal fins, the first elongated and reaching nearly to the second, which is shorter; behind the second dorsal and anal are eight or nine finlets like those of the mackerel. There is a keel on each side of the free portion of the tail, and the tail fin is crescentic. There are small scales all over the body, but they are larger in the anterior part, where they form a well-defined corselet. An air bladder is present. The tunnies approach the coasts in summer, chiefly for the purpose of spawning, and it is at this time that the fishery is carried on. Like the mackerel the fish are gregarious and migratory, but it is untrue that they all leave the Mediterranean in autumn, as was formerly supposed. The Phœnicians established a tunny fishery at a very early period on the coast of Spain, and the tunny appears on Phœnician medals of Cadiz and Carteia. Salted tunny was much esteemed by the Romans, and was called *Saltamentum Sardicum*.

TUNSTALL, CUTHBERT, an English clergyman; born in Hackforth, Yorkshire, in 1474; brother of the Sir Brian Tunstall who fell at Flodden; was educated at Oxford, Cambridge, and Padua, and became in turn Rector of Stanhope, Archdeacon of Chester, Rector of Harrow-on-the-Hill, Master of the Rolls, Dean of Salisbury (1521), Bishop of London (1522), and of Durham (1530). In 1516 he went on an embassy to Charles V. at Brussels, and there formed a fast friendship with Erasmus. Between 1516 and 1530 he was often employed on embassies to France and Germany, and in 1527 he had accompanied Wolsey on his magnificent embassy to France. He accepted the Royal Supremacy, but took alarm at the sweeping measures of reform under Edward VI.,

and was at length in 1552 deprived, through the influence of Northumberland, who coveted the wealth of the see. The accession of Mary restored the bishop, but under his mild rule not a single victim died for heresy throughout the diocese. On Elizabeth's accession he refused to take the oath of supremacy and was deprived of his charge, Sept. 29, 1559. He died in Lambeth Palace, Nov. 18, 1559.

TUPELO, a genus of *Cornaceæ* consisting of trees inhabiting the swamps and river banks of North America. The common tupelo (*Nyssa aquatica*) attains 30-50 feet, and its wood is much used for naves of wheels, etc. *N. multiflora*, the forest tupelo or black gum tree, has a growth like the beech. Its wood serves for wheels, pumps, bowls, mortars, wooden shoes, and various turners' work. The acidulous fruits are made into a pleasant preserve. *N. uniflora*, the swamp tupelo, grows to 80 feet, and the wood is used for corks and floats.

TUPPER, SIR CHARLES, a Canadian statesman; born in Amherst, Nova Scotia, July 2, 1821; studied medicine in Edinburgh University and practiced his profession in his native town. He was president of the Canadian Medical Association, 1867-1870. In 1855 he was made a member of the provincial legislature and was prime minister of Nova Scotia in 1864-1867. He warmly advocated the formation of the Dominion of Canada, which took place in 1867, and became a member of Sir John A. Macdonald's cabinet in 1870; became minister of public works in 1878; and in 1879-1884 was minister of railways and canals. While filling the latter office he promoted the construction of the great Canadian Pacific railway. In 1884 he was appointed High Commissioner for Canada in London. He was one of the negotiators of the fisheries treaty with the United States in 1887-1888, and was created a baronet in the latter year for his services in that matter. In 1895 he represented Canada at the International Railway Conference in London. He died in 1915.

TUPPER, MARTIN FARQUHAR, an English poet; born in London, England, July 17, 1810; was educated at the Charterhouse and under private tutors, and at 19 went to Christ Church, Oxford. A stammer hindered him from taking orders, so, after graduating in 1831, he entered Lincoln's Inn, and in 1835 was called to the bar. But a single will and marriage settlement was his first and last exploit in the way of law. Of his various works, 40 in number, one "Proverbial Philosophy" (1838-1867), brought him and his publisher, Hatchards, a profit of "something like $50,000 apiece." A friend "whose ambition it was to be Tupper's Boswell" predeceased him; but from his own huge "archives" he compiled "My Life as an Author" (1886)—a curious self-study of a poet. He died in Albury, his Surrey home, Nov. 29, 1889.

TURA, or **TOORA**, a river of west Siberia which joins the Tobol, 78 miles W. of Tobolsk. It is about 300 miles long.

TURANIAN, the title formerly conferred on a vast family of combinatory or agglutinative languages, which is made to comprise every tongue of Asia and Europe that is not either Aryan or Semitic, with the exception of Chinese and its cognate dialects. This family falls, according to Max Müller, into two great divisions, the northern and the southern; the northern being subdivided into five classes, Tungusic, Mongolic, Turkic, Finnic, and Samoyedic; the southern into four, Tamulic or the Dravidian languages of the Dekkan, Bhotîya or the dialects of Bhotan and Tibet, Taïc of Siam, and Malaic of the Malay and Polynesian islands. Under these nine classes he groups 116 dialects, and even then he does not stretch the term Turanian to its widest limits, which with many philologists include Accadian, the language of the Chaldæan inventors of cuneiform, and Basque, and by some are extended to North America. Naturally there is a dispute as to the correctness of the term at all; and while Max Müller asserts that the Turanian languages "share elements in common which they must have borrowed from the same source, and after formal elements are such that it would be impossible to ascribe them to mere accident," Peile in "Philology" (1877) maintains that the title Turanian "had better be avoided, as the agglutinative languages are much too different to give any ground at all for believing that they all belong to the same family. They agree only in the general principle of forming their speech; but no common bond has yet been found to bring together the main groups of the so-called Turanian peoples; and it is not likely there is any." This principle, the combinatory, might certainly have been independently arrived at by different nations, and it is equally rash to regard Japanese as necessarily cognate to Finnish because both are agglutinative languages, as it would be to connect the Semitic and Aryan tongues on the score of their common possession of inflection.

TURBELLARIA, in zoölogy, an order of *Platelminthes;* flat worms of low organization, ribbon-shaped, leaf-shaped, oval, broad, or long, inhabiting fresh or salt water, or damp localities on land. The smallest are not larger than some of the Infusoria, which they approach in appearance, while the largest are many feet long. Only one genus, *Alaurina* is divided into distinct segments, and the outer surface of the body is everywhere beset with vibratile cilia. The aperture of the mouth is sometimes situated at the anterior end of the body, sometimes in the middle, or toward the posterior end of its ventral face. In many the oral aperture is surrounded by a flexible muscular lip, which sometimes takes the form of a protrusile proboscis. All have water vessels, opening externally by ciliated pores, and pseudhæmal vessels; most possess eyes, and some have auditory sacs. Some are monœcious, and others dicœcious; in most the embryo passes by insensible gradations into the form of the adult, but some undergo a remarkable metamorphosis. The Turbellaria are variously divided by different authors. Huxley divides them into *Aprocta* (having no anal aperture) and *Proctucha* (having an anal aperture). The first group contains the *Rhabdocœla* and *Dendrocœla* of other authors; the second is equivalent to the *Rhychocœla* or *Nemertea.*

TURBINE. The common water turbine is an application of the water-wheel, and may be said to consist of a motor, water-driven. In its simplest form, it is a wheel, fitted with a number of buckets, or vanes, against which a stream of water is caused to flow, thus producing rotation of the wheel. In modern machines, however, this simple principle has been developed in a number of ways. In some turbines, there are tiers of buckets, one above the other, while in turbines of the "vortex" type, the vanes are radial, and the water is admitted to the center of the wheel and flows outward. In a third type, the so-called "mixed flow" principle is used, the water being admitted at right angles, and also parallel, to the axis of rotation. Water turbines are largely used for driving dynamos in converting water-power to electric-power. See STEAM TURBINE.

TURBOT, in ichthyology, *Rhombus maximum,* the most highly valuable of the *Pleuronectidæ,* or flat fishes, for the table. The turbot is a broad fish, scaleless, with numerous flattened, conical tubercles on the upper side; the lower eye is a little in front of the upper eye, and the lateral line makes a semicircular curve above the pectoral fin. In color it varies from gray to brown, often with spots of a darker hue. Turbot are migratory fish, traveling in companies where the bottom is sandy. They feed chiefly on small fish, crabs, and shell fish; but the bait used is always some fish of bright color and tenacious of life, for, though turbot are very voracious, they will never touch a bait that is not perfectly fresh. Weight from 5 to 50 pounds. In the English Channel turbot are taken by trawling. The turbot was known and prized by the Romans, and the fourth satire of Juvenal celebrates the fact that Domitian convoked the Senate to decide how a monster turbot that had been brought to him should be cooked.

TURCO-ITALIAN WAR. The acquisition of territory in north Africa by France shortly after the Franco-Prussian War had created deep resentment in Italy, which feared the loss of prestige on the Mediterranean. Especially alarming to Italy was the seizure of Tunis in 1881, by France. This incident, more than any other single factor, led Italy to enter the TRIPLE ALLIANCE (*q. v.*) with Austria and Germany. Thus protected, Italy set forth to acquire possessions in Africa, in rivalry with France. To weaken the Triple Alliance, however, France hastened to arrive at an agreement with Italy over their separate spheres of influence in Africa. Thus doubly strengthened, Italy declared war against Turkey on Sept. 29, 1911, choosing that time probably because of the disorder in the internal affairs brought about by the Young Turk Revolution. Italy immediately landed troops in Tripoli, and Cyrenaica, which was the territory in Africa coveted. Here the war was fought out, and because of the difficulty of the Turks in bringing troops to this distant possession, the Italians were able to gain a long series of victories. On Oct. 18, 1912, Turkey signed a treaty surrendering this territory to Italy, at Lausanne, Switzerland. Throughout the war all the other European countries had maintained an attitude of strict neutrality, with the exception of Russia, which had vetoed the Italian plans for an attack on the Dardanelles. There can be no doubt that Turkey would not have signed the Lausanne treaty had it not been for the fact that already Montenegro had fired the first shot of the campaign of invasion already threatened by the Balkan states.

TURENNE, HENRI DE LA TOUR D' AUVERGNE, VICOMTE DE, a French military officer, second son of Henri,

Duc de Bouillon, and of Elizabeth, daughter of William I., Prince of Orange; born in Sedan, Sept. 11, 1611. He was brought up in the Reformed faith. At the age of 13 he went to learn the profession of arms under his uncles, the Princes Maurice and Henry of Nassau. Recalled (1630) to France by Richelieu, he was made colonel of a regiment, and first distinguished himself at the siege of La Motte in Lorraine. During the retreat of the French army from Mainz (1635), his courage, fortitude, and humanity were conspicuous. In the campaign of 1637-1638 he captured Landrecies, Soire-le-Château, Maubeuge, Breisach, etc. During 1639-1642 he served in Italy, chiefly under the Comte d'Harcourt, winning numerous small victories, and capturing Turin, Moncalvo, Ceva, Mondovi, and Coni. His military reputation was now firmly established, and he received the title of Marshal of France.

Toward the close of 1643 he was sent to the Rhine, and intrusted with the command of the French troops. His achievements during the last five campaigns of the Thirty Years' War covered him with glory, and proved him to be a leader indomitable in spirit and inexhaustible in resource. He captured Philipsbourg and Mainz (September, 1644); held in check his three opponents, Mercy, Gleen, and the Duke of Lorraine; saved Speyer and Baccarat; retook Kreuznach; overran during the winter Suabia and Franconia to the gates of Nuremberg and Würzburg; won the battle of Nördlingen (Aug. 3, 1645) in spite of the obstinate rashness of the Duc d'Enghien; drove the Spaniards out of the electorate of Treves; by a rapid and skillful march through Westphalia and Hessen united himself with the Swedes; swept over Suabia and Franconia; invaded Bavaria; was on the point of totally overwhelming the Imperialists, when orders came to withdraw to the Rhine, and, finally (May 17, 1648), utterly defeated Montecuculi and Melander at Sommerhausen on the road to Augsburg. This victory, followed by that of Condé, over the Spaniards at Lens, brought about the peace of Westphalia (Oct. 24, 1648), and closed the Thirty Years' War.

Then followed the troubles of the Fronde, in which he at first took the side of the Frondeurs, and through the seductive influence of Mme. de Longueville was induced to enter into culpable negotiations with the Spaniards for an invasion of France. But after a defeat at Rethel (Dec. 15, 1650) he became ashamed of civil war, and returned to his allegiance to the crown. Condé, meanwhile, had quarreled with Mazarin, and became a Frondeur. The two greatest generals of the age were now opposed to each other; and the firmness, coolness, and scientific skill of Turenne proved more than sufficient to baffle and defeat the impetuous valor of his adversary. In 1652 the victories of Jargeau (March 30), of Etampes (March 4), of the Faubourg St. Antoine (July 2), together with his later splendid strategy, placed the young king in possession of Paris (Oct. 21). In 1653 he was in command of the N. frontier, and frustrated all the attempts of Condé and the Spaniards to penetrate through Picardy; in 1654 he stormed the Spanish camp near Arras, and inflicted enormous loss on the enemy; and in 1658 forced Dunkirk to surrender, after destroying the Spanish army of relief. The fall of Dunkirk was followed by the capture of Bergues, Furnes, Dixmude, Oudenarde, Ypres, Comines, De Gramont, Ninove, etc. The treaty of the Pyrenees Nov. 7, 1659, was the result of the brilliant successes of Turenne. When war broke out between France and Holland in 1667, fortune still attended him. In less than four months he captured Charleroi, Ath, Tournai, Douai, Oudenarde, Lille, and Alost. In 1668 he formally abjured Protestantism after considerable reading and reflection—an act which still further advanced him in the favor of Louis. The war between France and Holland (1672-1678) witnessed his last and greatest achievements. His defense of the Rhine with an inferior force, and his invasion of north Germany, were prodigies of military skill and daring; but his devastation of the Palatinate (1674), though done under express orders, has left a dark stain on his reputation. On July 27, 1675, he was killed by a cannon ball at the battle of Salzbach. He was buried at St. Denis amid a national mourning. As a general Turenne has rarely been surpassed. Napoleon admired him without limit. His character as a man is still more admirable. He was modest, simple, truthful, and full of genuine kindliness to all beneath him, especially to his war-worn veterans, to whom he liberally gave of his private resources.

TURGENIEFF, IVAN, a Russian novelist; born in Arel, Nov. 9, 1818, and was educated at home and in Berlin. His writings show a wonderful insight into human motives and feelings. They include: "Poems" (1841); "Parascha" (1843); "Improvidence" (1843); "Andrei Kolosov" (1844); "Andrei" (1845),

a volume of poems; "The Conversation" (1845); "The Landlord" (1846); "Three Portraits" (1846); "Khor and Kalinych" (1847); "The Bully" (1847); "Dimitri Rudin" (1852); "Two Friends" (1853); "Quiet Life" (1854); "Rudin" (1856); "Faust" (1856); "Asya" (1858); "A Nest of Noblemen" (1859), also translated as "Lisa"; "First Love" (1860); "Hamlet and Don Quixote" (1860); "On the Eve" (1862); "Fathers and Sons" (1862); "Visions" (1863); "The Dog" (1863?); "Story of Lieutenant Jergunov" (1864); "The Brigadier" (1866); "Smoke" (1867); "An Unfortunate" (1868); "A Strange Tale" (1869); "A King Lear of the Steppe" (1870); "Knock! Knock! Knock!" (1870); "Pegasus" (1871); "Chertopchanov's End" (1872); "Punin and Baburin" (1874); "The Living Skeleton" (1875); "The Watch" (1875); "Some One Knocks" (1875); "The Dream" (1876); "New" (1877), also translated as "Virgin Soil"; "Father Alexei's Story" (1877); "Song of Triumphant Love" (1881); "The Old Portraits" (1882); "The Despairing One" (1882); "Poems in Prose" (1882); "Klara Milich" (1883); "The Conflagration at Sea" (1883). He died in Bougival, near Paris, Sept. 3, 1883.

TURGITE (after the Turginsk copper mine, near Bogoslovsk, Urals, where first observed), a common iron ore frequently mistaken for limonite, to which it bears a strong resemblance; occurs in fibrous masses, sometimes botryoidal and stalactitic, also earthy; hardness, 5-6; sp. gr. varying according to texture, but ranging between 3.56 and 4.681; luster, submetallic and satiny when seen at right angles to the fibers, also dull in the earthy varieties; color, reddish-black to dark-red; streak, red; opaque. Composition: Sesquioxide of iron, 94.7, water, 5.3=100, which yields the formula $2Fe_2O_2$, H_2O. Found frequently associated with limonite, but is easily distinguished by the color of its streak.

TURGOT, ANNE ROBERT JACQUES, a French statesman; born in Paris, France, May 10, 1727. He was educated for the Church, but renouncing this purpose he studied law, and in 1761 was appointed intendant at Limoges, which post he occupied for 12 years. Shortly after the accession of Louis XVI. in 1774 Turgot was appointed comptroller-general of France, and in order to reform the political and financial condition of the country, he moderated the duties on articles of the first necessity, freed commerce from many fetters, and encouraged industry by enlarging the rights of individuals, and abolishing the exclusive privileges of companies and corporations. Such, however, was the opposition of the clergy and nobility to his reforms that he was dismissed from office in 1776, and retired into private life. He died in Paris, March 20, 1781.

TURIN, a city of north Italy; capital of a province of the same name; at the confluence of the Dora Ripera with the Po, and between these two rivers. The city is essentially modern, the streets being broad and regular and many of them are lined with arcades, while there are numerous wide squares and gardens. The chief buildings are the cathedral, a renaissance building, completed in the beginning of the 16th century, and remarkable for its marble façade; the royal palace, a plain brick building, which contains the king's private library, with valuable MSS., and the royal armory; the university, a fine edifice recently constructed, in which there is a large library; the Palazzo dell' Accademia delle Scienze, with a picture gallery and museums of natural histories and antiquities; the Palazzo Carignano, used at one time by the Sardinian and Italian Parliaments when they met here (1848-1865), and now given up to a collection of natural history; the Madama Palace, an old and interesting building, and several theaters.

The environs of the city are beautiful, and offer many objects of interest. Among the educational establishments, in addition to the university, which is attended by over 2,000 students, are an episcopal seminary, a royal military academy, a polytechnic school, and various other colleges and schools.

The manufactures consist, besides the staple of silk, chiefly of woolens, cottons, linens, paper, iron mongery, earthenware, and porcelain. Turin in recent years has become one of the chief manufacturing cities of Italy. Turin was anciently the capital of a tribe called the Taurini, and under the Roman empire was called Augusta Taurinorum. It was long the capital of Savoy, then of the Sardinian kingdom, and from 1861 to 1865 of United Italy. Pop. about 450,000.

TURKESTAN ("land of the Turks"), the name of a wide, longitudinal, depressed region in central Asia, which comprises the basins of the Amu-Darya and the Tarim; separated on the S. by the Kuen-Lun from Tibet, by the Karakorum (Mustagh) and Hindu Kush from India and Ladak, the latter chain continuing W. in the mountains of Afghanistan and Persia. In the N. it is separated from Zungaria and the Russian

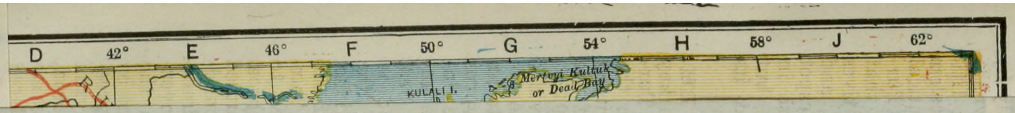
province of Semipalatinsk by the Thian-Shan Mountains. Divided by the Pamir plateau, or "roofs of the world," into two distinct portions, it has a total estimated area of 1,576,400 square miles. Eastern Turkestan shades off into the desert of Gobi, while western Turkestan, sinking to the level of the Kirghis steppes, extends to the shores of the Caspian. These two regions have a very dissimilar character, the latter containing the Iranian khanates, now mainly embraced in Russia, the former from olden times, as now, the arena of Turkish adventurers, who have more or less successfully asserted their dominion against China.

Within western Turkestan are comprised the former Russian government-general of Turkestan, the former khanates of Bokhara and Khiva, the Turcoman steppes, and the hill districts of Karategin on the upper Oxus. The country is nearly synonymous with the basin of the Amu-Darya, and Russia formerly held both the right bank of the river in what used to be Khivan territory, and its delta, green with rice fields. The Amu valley and delta are covered with gray clay, impermeable to water, and therefore invaluable to the inhabitants for the construction of canal banks. The non-irrigated and far greater part of western Turkestan, with the exception of a few table-lands, is covered with black or yellow sands, and the only land fit for cultivation, in addition to the oases along the river, are the slopes of the hills. Khiva is the principal of the oases, and the Amu-Darya, at its greatest height in July, overflows the desert in the direction of the Caspian for 50 miles.

The climate is one of extremes, and the heat of autumn is aggravated by a wind laden with fine dust which is almost suffocating, and darkens the air for a week at a time. Gold is found in the Obi district, and in the Karatan Mountains are extensive coal deposits, besides valuable ores. Wheat and clover are the winter crops; all other cereals, such as maize, millet, barley, rice and peas, are sown in April and gathered in August. Grapes are cheaper than potatoes and yield a good wine. Bokhara cotton is of excellent quality. Tobacco and silk are also largely produced; some tobacco seed from Maryland is succeeding admirably. The chief races are Usbegs, who are purely Turkish; Tajiks, the Iranian and trading people; the predatory Turcomans, Turks with an Iranian infusion; and the nomad Kirghis and Kara-Kalpacks. The Russian government of Turkestan was formed in 1867; it was divided into the provinces of Syr-Darya, Ferghana, and Samarkand; and had an area of 257,134 square miles, and pop. about 3,000,000. The prevalent language is akin to Turkish.

Eastern Turkestan is called Nan-ly by the Chinese, Altai-shar ("six towns") by adjoining Mohammedans, and Iiti-shar ("seven towns") by its Moslem rulers. It may be considered as identical with Kashgar. Till 1853, eastern Turkestan was a Chinese province, but that year witnessed a massacre by the natives of the Chinese who rejected Islam, and subsequently it was ruled by its despot liberator, Yakoob Beg, till his death in 1877. He was succeeded by his son, but the Chinese Government recovered its lost territory in 1879.

TURKEY, or the **OTTOMAN EMPIRE**. Prior to the World War Turkey was composed of Turkey in Europe, Turkey in Asia, and certain islands in the Mediterranean. Considerable territory was lost following the conclusion of the First Balkan War (November, 1913). Turkey in Europe was in part divided among Bulgaria, Serbia, Montenegro, and Greece, and in part created into an independent state of Albania. Cyprus and Egypt, which formerly were included in the Ottoman empire, were annexed to the British empire, the first in November, 1914, and the second in January, 1915. By the terms of the Peace Treaty of the Allied nations, signed on May 11, 1920, the area of the empire was still further reduced. Turkey ceded practically all of Thrace to Greece, as well as Tenedos and Imbros, and the islands in the Ægean, occupied by Greece. Smyrna, with the surrounding strip of territory, was to be administered by Greece under Turkish sovereignty for five years, after which the territory might annex itself to Greece by plebiscite. By the terms of a later agreement, signed on March 17, 1921, Smyrna was returned to Turkey. Mesopotamia, Palestine, Armenia, and Hedjaz became independent. The first three were placed under mandatories. Kurdestan was to be autonomous. Several islands in the Ægean were ceded to Italy. Turkey retained Constantinople, but the coastal area of the Dardanelles, Marmora, and Bosporus was placed under the control of the Commission of the Straits appointed by the League of Nations. The area taken from Turkey was 438,757 square miles, with a population of about 12,000,000. The area of the remaining territory is 174,900 square miles, with a population of about 8,000,000. In the territory remaining under Turkish rule, Moslems greatly preponderate. In Asi-


D
42°
E
46°
F
50°
G
54°
H
58°
J
62°
KULALI I.
Merkezi Kultuk
or Dead Bay



...right, by G. W. Bacon & Co., Ltd. 1921

atic Turkey there is a large Turkish element with about 4,000,000 Arabs, besides Greeks, Syrians, Kurds, Circassians, Armenians, Jews, and other races. The chief towns remaining under Turkish rule and their populations, are as follows: Constantinople, 1,000,000; Brussa, 110,000; Kerbela, 65,000; Sivas, 65,000; Trebizond, 55,000.

Production and Industry.—Agriculture is carried on according to the most primitive methods in nearly all parts of the empire, although the soil, for the most part, is extremely fertile. The chief products are tobacco, cereals, cotton, figs, nuts, almonds, grapes, olives, and other varieties of fruit. There are in Asiatic Turkey about 17,000,000 acres under cultivation. The principal tobacco districts are Samsun, Bafra, and Charchambe. The production in 1917 was valued at 650,363 Turkish pounds. The cotton output is about 200,000 bales annually. About 21,000,000 acres of land are under forest.

Commerce.—The latest figures available are for 1916 and 1917. In that year the imports were valued at 22,105,304 Turkish pounds, and the exports at 34,058,581 Turkish pounds. As Turkey was at that time under the practical rule of Germany, by far the largest portion of her exports were to that country. The imports were received chiefly from Germany and Austria-Hungary. England, prior to the war, had the largest proportion of trade. Industrial and commercial conditions during 1919 were normal and were marked by high prices, large production, and speculation. During that year nearly one half the trade of Constantinople was with Russia, and the remainder was with the Balkan states and with other parts of Turkey. The chief imports were cotton, wool, linen and silk textiles, ready-made clothing, leather goods, and food of all kinds. The chief exports were tobacco, wool and mohair, rugs and carpets, olive oil, castor beans, and nuts.

Mineral Production. — The Turkish provinces of Asia are rich in minerals, which, however, have been little worked. There are deposits of silver, manganese, zinc, antimony, borax, asphalt, coal, petroleum, and salt.

Transportation.—Prior to the World War there were in European Turkey 1,046 miles of railway, and in Asiatic Turkey, 2,865. The Bagdad railway had been extended into Cilicia. The total railway mileage in 1916 was 3,720. There are about 30,000 miles of telegraph line.

Finance.—The total revenue in 1918-1919 was 33,965,698 Turkish pounds, and the expenditure was 51,762,761 Turkish pounds. By the Treaty of Peace with Turkey, it was provided that Turkish finances shall be controlled by a Finance Commission composed of representatives from Great Britain, France, and Italy. The total debt of Turkey on Aug. 31, 1919, was 465,673,338 Turkish pounds.

Army.—In August, 1914, the army consisted of 39 divisions, with a strength of about 150,000 men. During the war it was expanded to 70 divisions, and at the time of the armistice, nearly 2,700,000 men had been recruited. The strength during the war was approximately 650,000. By the Treaty of Peace, Turkey lost possession of all her fortresses in Europe and Asia. The defenses of the Dardanelles and Bosporus were demolished, and Great Britain, France, and Italy reserved the right to maintain naval, military, and air forces in the Straits. The armed forces were reduced to a maximum of 50,000 men, and compulsory service was abolished.

Navy.—By the terms of the Treaty of Peace, the Turkish navy was abolished, except for certain vessels retained for police and fishery duties. There are few vessels of real value.

Religion and Education.—The established state religion is Mohammedan. The Sultan is the supreme head. The chief ecclesiastical official is the Sheikh-ul-Islam. His duties are judicial and legal, rather than spiritual. In Asiatic Turkey the Mohammedans form the great majority of the population. Elementary education is nominally compulsory for all children of both sexes. The state school is under the direct control of the Minister of Public Instruction. Schools of various kinds in the empire number about 40,000 and contain about 1,500,000 pupils. There are training schools for teachers, but the general level of efficiency in the schools is low. There are a large number of foreign schools conducted by French, English, and American missionaries. The University of Constantinople was reorganized in 1918. There are a number of state schools, including the Imperial Art School and a theological seminary.

Government.—Turkey, prior to the World War, was nominally a constitutional monarchy, but in reality was an absolute monarchy. The formal constitution was adopted in 1876, which provided for a Parliament and other features of constitutional government. Under Abdul-Hamid II., however, this constitution became a dead letter. In 1908, the prevailing discontent, especially in the army, compelled the Sultan to issue an Imperial decree for a convoca-

tion of a new Parliament and a constitutional government was restored on July 23, 1908. Following the armistice in 1918, Turkey was practically under control of the Allied Powers, especially Great Britain, although the Sultan had nominal rule.

History.—The earliest notice of the Turks, or Turcomans, in history is about the year 800, when, issuing from various parts of Turkestan, they obtained possession of a part of Armenia, called from them Turcomania. They afterward extended their conquests over the adjacent parts of Asia, Africa, and Europe, occupying Syria, Egypt, and eventually the territory that remained to the Greek empire. In 1453 Constantinople was taken by Mohammed II., and became the capital of the empire. The Morea and the islands were afterward overrun, with parts of Hungary, the Crimea, and the shores of the Black Sea. They next took the whole of the country now forming Turkey in Asia, the Hezja in Egypt, and the regencies of Tripoli, Tunis, and Algiers. From the accession of Mohammed IV. in 1648, the Turkish empire began rapidly to decline, the vice and profligacy of the harem and seraglio being reflected in every branch of the state. The shelter given to Charles XII. of Sweden, in 1711, led to the first war with Russia, which must have ended in the ruin of that empire but for the cupidity of the grand-vizier, who accepted a bribe to allow Peter the Great and his army to escape.

From that time till 1774 the war with Russia was frequently renewed, and, by the peace of the latter year, a large extent of territory and the Black Sea were ceded by the Porte to Russia. In the campaign of 1787 the Turks were still more unfortunate, and, though in 1789, under Selim III., they retook Belgrade, they were elsewhere defeated. In 1807 the Emperor Alexander declared war against the Porte, and in the campaign advanced his frontier to the Pruth by the conquest of Bessarabia; the next severe loss the Turks sustained was from the revolt of the Greeks and the subsequent independence of their country. In 1854 war was once more declared against Turkey by Russia, when England, France, and Sardinia joined the Porte to enable the Sultan to resist the threatened invasion of his dominions; the burning of the Turkish fleet off Sinope, the campaign on the Danube, the battles of Alma, Inkerman, Balaklava, and the bombardment and capture of Sebastopol, were some of the results of the two years' war with Russia; Turkey, for the first time in nearly a century, sheathing the sword without the loss of a foot of territory. Subsequently, Turkey engaged in a war with the Montenegrins, who sought to cast off her yoke; and, later, was concerned in suppressing revolutionary tendencies in the Danubian principalities. In 1875, an insurrection broke out in Herzegovina, and in October, Turkey declared her partial insolvency.

In February, 1876, the six great European Powers proposed a scheme of reform which was largely accepted by the Sultan. On May 30 Sultan Abdul-Aziz was deposed. His nephew, Murad V., succeeded him, but was also deposed and followed, Aug. 31, by his brother, Abdul-Hamid II. On Jan. 18, 1877, the Grand Council of Turkey refused all interference by the European Powers and Russia declared war on April 21. Turkey was badly beaten and an armistice was signed in February, 1878. The terms of the treaty of peace at San Stephano (March 3) were subsequently modified at the Congress of Berlin. On April 19, 1897, Turkey was forced by Greece to declare war. The war was short and ended in Turkey's favor on June 3, Greece agreeing to pay a war indemnity of $2,000,000.

In 1898 Crete was taken in charge by the Great Powers and the island was handed over for government to Greece.

In the first decade of the 20th century, Turkey seemed on the point of collapse. There were revolts in Arabia and conditions of anarchy prevailed in Albania and Macedonia. In the latter country conditions led to foreign intervention, and the Sultan, much against his will, acceded to new reform schemes, which, however, were never carried out. In the meantime, the public debt was increasing and the railways, mines, and banks were falling into the hands of the foreign capitalists. Just as Turkey appeared on the point of collapse, a movement for the rejuvenation of the country was started by a body called the Young Turks, who for many years had been working to bring about reform measures. On July 23, 1908, the central body, called the Committee of Union and Progress, headed by Enver Pasha, proclaimed the restoration of the constitution of 1876. An attack on Constantinople was threatened and the Sultan, greatly terrified, issued a decree restoring parliamentary government. Taking advantage of these disturbances, Austria, in October, 1908, annexed Bosnia and Herzegovina and at the same time Ferdinand of Bulgaria proclaimed the independence of that country. The new Turkish Government was obliged to agree. Albania became

still more turbulent in 1909, and there were serious disturbances in Arabia and Macedonia. A counter-revolution started which, however, was promptly suppressed. Parliament now voted to depose Abdul-Hamid and placed him practically in captivity near Saloniki. His brother, Mohammed V., was made Sultan in his place. Measures were now taken on a large scale to Ottomanize the Turkish empire. The Bulgarians, Greeks, and Serbians in Macedonia bitterly resented this, and Greece, Bulgaria, and Serbia began to draw more closely together with the object of protecting their nationals in Macedonia. In 1911 Italy seized Tripoli and Cyrenaica. This was followed by a war between Turkey and Italy. Peace was not concluded until 1912, when Italy gained a large territory, including Tripoli and Cyrenaica. During the summer of 1912, the Balkan states formed the Balkan League, which resulted in the Balkan War. See BALKAN WARS. The outcome of this struggle was the loss of all Turkish possessions in Europe, except Constantinople, Adrianople, and a small adjacent territory.

German influence had become strong in Turkey during these events. The Turkish army was armed and drilled by Germans, and the German Government secured the greater share of new concessions, including the Bagdad railroad. Germany's sympathy was shown toward Turkey during the Balkan War. It was no occasion for surprise, then, when Turkey chose to side with Germany and Austria against the Allied Powers in the World War.

The Turkish Government, indeed, in the first days of the war, declared its neutrality, but mobilization of her military forces at once began. The commander-in-chief of the Turkish armies was Enver Pasha, who had been educated in Germany and whose ideals were those of his German associates. The German general, Liman von Sanders, had brought about the reorganization of the Turkish army on a modern basis. On the declaration of war between Germany and Russia, Turkey at once closed the Dardanelles and the Bosporus to all shipping, planting mines at the entrances. This effectively bottled up the Russian fleets in the Black Sea.

On Oct. 30, 1914, Russia declared war against Turkey, and the Sultan at once declared war against Russia, France and England. On Nov. 17, Great Britain formally declared a protectorate over Egypt. The Sultan endeavored to foment a "Holy War" against the Allies, but this met with little response outside of the Turkish empire.

The first military operations of importance took place in the Caucasus where a Turkish army advanced into Persia. This force was defeated by Russians on Jan. 30, 1915. There were other Russian successes in Persia and in the Caucasus. The main operations, however, were carried on in Transcaucasia, where, on Dec. 26, 1914, a great Turkish army was decisively beaten by Russian forces, and for some months Turkey was unable to carry on further operations in this field. The campaign was, however, conducted for the purpose of capturing the Suez Canal, in January, 1916. This was frustrated by prompt British resistance which drove back the Turkish forces, leaving the British in possession of the canal. Other operations early in the war occurred in the Persian Gulf. The British disembarked a force near Basra, which the Turks evacuated on their approach. Here the British prepared a base camp for an attack upon Bagdad, about 300 miles distant. 50 miles above Basra, the Turkish army had been mobilized. The British attacked this point and finally succeeded in defeating the Turkish army, which surrendered. The British then intrenched themselves, having cut off Turkey from any advance on India.

The most spectacular operations in which Turkey was engaged during the first period of the war was the effort on the part of the French and British to force a passage of the Dardanelles. Great preparations having been made, the main attack upon the Gallipoli forts was begun on Feb. 19, 1915. It is probable that Turkey had concentrated half a million men on the peninsula. The British, after a severe bombardment of the forts, landed marines, but these were attacked by superior forces of Turks and were compelled to re-embark. These attacks continued for months following, but with little success. The Allies, during the progress of the bombardment, lost several of their best battleships.

In the meantime the Allies were preparing an expeditionary force in Egypt which was later transferred to the island of Lemnos, which had been occupied by the Allies. On April 23, 1915, the first of these forces disembarked on the Gallipoli peninsula under cover of the guns of the warships. The Turkish troops, who were under the command of the German General von Sanders, opened a furious fire on the landing parties of the Allies, but the latter, scal-

ing the hillsides, drove the Turks back and succeeded in obtaining a foothold. For the months following, almost continuous fighting went on, through which the Turks lost considerable ground. In the beginning of September, however, they began vigorous counter-attacks and succeeded in driving back the Allied troops at a high cost in killed and wounded. The attempt to capture the peninsula persisted and would probably have succeeded, but for serious blunders in the operation. In the autumn of 1916 it became obvious that the expedition was a failure, and the British troops were withdrawn in December. This concluded the most disastrous series of military operations carried on by the Allies during the first period of the war.

In the meantime, the campaign in Mesopotamia was well under way. On June 3, 1916, the British captured Amara, 75 miles above Kurna. Kut-el-Amara, a strongly fortified post, still remained in the hands of the Turks. A four days' battle, which ended on Sept. 29, was ended by the defeat of the Turkish armies and the capture of Kut-el-Amara. The British, under General Townsend, now engaged upon a campaign for the capture of Bagdad. The advance began in the early days of October, and was strongly opposed. The Turks retired until they reached the vicinity near Ctesiphon, where they were strongly intrenched. After a severe struggle, the Turks were obliged to fall back. They received re-enforcements, however, and repelled the British forces. Further re-enforcements having been received, they were able to continue to force back the British troops until they finally reached Kut-el-Amara, with a loss of fully one-third of the strength with which they had started. Here the British were able to intrench themselves and hold back the Turkish army. They were, however, cut off from communication with the outside world. Attempts were made to send relief, and British forces defeated the Turkish army near Kut-el-Amara, on Jan. 6, 1916. The conditions of the country, however, made it impossible for the troops to advance farther. They were subject to various attacks by the Turks and finally the British commander decided to move up the left bank of the Tigris and attack the Turkish position from the rear. The movement failed, and the British were obliged to withdraw. Attempts were made to relieve Kut during the next months. On April 8 a sharp battle was fought at Sanna-i-yat. Here the British were unable to advance. By this time the besieged army at Kut-el-Amara had reached the point where food had become scarce, and physical endurance was well nigh exhausted. On April 28, 1916, the British garrison surrendered to the Turks, thus ending the siege which lasted 143 days.

The surrender caused a deep sensation throughout all the countries at war, and the British Government determined to make a further and more extensive attempt to capture Bagdad. A large army was gathered under the command of Lieutenant-General Sir Frederick Maud. On Feb. 26, 1917, Kut-el-Amara was captured after a stubborn resistance. The British continued steadily on up the Tigris river, although the Turks resisted with the utmost firmness. On March 11, 1917, Bagdad surrendered. Large quantities of stores and war materials fell into the hands of the British.

Campaigns continued in the Caucasus during the progress of the Mesopotamian operations. Turkey raised a large army for the purpose of seizing Kars and Tiflis and controlling the great Caspian oil fields. This army numbered about 140,000 men and was opposed by a Russian army of about 110,000. Operations began on Nov. 20, 1914, and were carried on with varying success during the following months. The Turks were decisively defeated in the second week of January, 1915, and the Turkish offensive in the Caucasus was effectively checked for the time being. Attempts by the Russians to carry on operations farther south were defeated by strong Turkish forces. The Russian armies were re-enforced, however, and checked further advances on the part of the Turks. Hostilities continued in Persia and the Caucasus during the first months of 1915. On May 23 the Russians occupied the city of Van and other places. By the autumn of this year, Russia was able to devote more strength to the Caucasus front and under the direction of Grand Duke Nicholas, a campaign was begun for the capture of Erzerum. The city was taken in the second week of February, 1916. The Russian advance continued toward Trebizond, the Turkish base of supplies on the Black Sea. On April 18 the city was captured. The larger part of Turkish Armenia was now in Russian hands. The Russians continued minor operations, but in the spring of 1917 disturbances in Russia, following the revolution, prevented active military operations.

Following the capture of Bagdad, the British forces proceeded with the conquest of Syria and Palestine. Prior to the beginning of this campaign, it was finally announced that the country would

be turned over to the Jews for their re-establishment as a political entity. This resulted in the working for the Allied cause among the Jews of all the Allied and neutral countries. Operations began on Oct. 27 with bombardment of Gaza by English and French warships. This was followed by land attacks by British cavalry and foot soldiers. The Turks were driven back with great loss, and the city of Gaza was taken on Nov. 7. On Nov. 16 Jaffa was captured without opposition. The British, in the face of heavy resistance, continued toward Jerusalem and in the early part of December, succeeded in isolating that city, which surrendered on Dec. 11. After the occupation of Jerusalem, the British continued their operations in the surrounding country. They finally succeeded in clearing it of Turkish forces.

The Arabs in the Hedjaz, that part of Arabia adjoining the Red Sea, had in the meantime arisen against Turkish rule. In July, 1917, the insurgents defeated the Turkish troops at Maan and occupied that town and Akaba, the latter town being at the head of the Red Sea, on a gulf bearing the same name. During September, the Arabian forces, operating under the King of the Hedjaz, carried on a series of important operations against the Turks and Arabians. King Hussein had been officially recognized by the Allied Governments and Hedjaz was declared an independent kingdom.

On Oct. 12, 1918, the Turkish Government opened negotiation for a separate peace with the Allies, and on Oct. 30, an armistice was arranged between the Turkish and the Allied Governments, and the war ceased in the Turkish empire. In accordance with the terms of the armistice, British troops were allowed to land on the peninsula of Gallipoli, and on Nov. 13, 1918, Allied warships passed through the Dardanelles and landed troops in Constantinople.

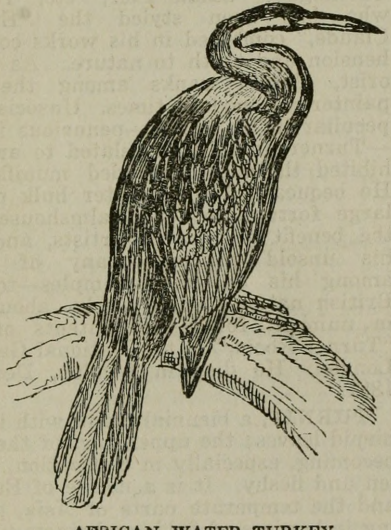
During the progress of the war, the people in Armenia had suffered from repeated massacres, and the devastation in this country was alleviated as far as possible by relief expeditions sent out by the United States and other countries. On March 7, 1920, Mohammed VI. established a distinctly pro-Ally government, with David Pasha as Grand Vizier. On April 13, Kemal Bey, one of the former pro-German commanders, was publicly hanged in Stamboul for complicity in the Armenian massacres.

Turkey was represented at the Peace Conference by a delegation, but this received small consideration. On July 11, the court martial sentenced many former prominent Turkish officials, including Enver Pasha, Talaat Bey, and Djemel Pasha, to death. All three escaped. Talaat Bey, however, was assassinated in Berlin, on March 15, 1921. These three men were practically in control of Turkey during the war. The treaty with Turkey was handed to the Turkish delegates in Paris, on May 11, 1920. Its provisions included mandates over Syria and Mesopotamia, while Palestine was to be a Jewish state under British protection. Thrace was awarded to Greece. In reply, Turkey refused to cede Smyrna or parts of Thrace, and they were at once occupied by Greek forces. The so-called Turkish Nationalists, directly after the terms of the treaty had been published, established a separate government in Anatolia, headed by Mustapha Kemal and declared that the terms of the treaty would be resisted to the utmost. A Greek army was dispatched against the Nationalists and hostilities were carried on throughout 1920, with no decisive results on either side. The Turks also carried on operations in Syria.

The Turkish government did not sign the Treaty of Peace until March 1921, when, following a conference in London between representatives of the Allied countries and the Turkish Government and Turkish Nationalists, an agreement was finally arrived at. By the terms of this, Smyrna was returned to Turkey, and an agreement was made whereby a commission would be appointed to determine on ethnological, military, and commercial lines to whom Thrace rightly belongs. Turkish sovereignty over Constantinople was confirmed. Mohammed V. died on July 3, 1918, and was succeeded by Mohammed VI. The following is a list of the Sultans of Turkey (House of Othman):

Othman, or Osman I.	1299
Orchan	1326
Amurath I.	1360
Bajazet I., "The Thunderbolt,"	1389
Solyman I.	1402
Mohammed I.	1413
Amurath II.	1421
Mohammed II. (Conqueror of Constantinople)	1451
Bajazet II.	1481
Selim I.	1512
Solyman II., "The Magnificent,"	1520
Selim II.	1566
Amurath III.	1574
Mohammed III.	1595
Achmet I.	1603
Mustapha I.	1617
Osman II.	1618
Amurath IV., "The Intrepid"	1623
Ibrahim	1640
Mohammed IV.	1649
Solyman III.	1687
Achmet II.	1691
Mustapha II.	1695
Achmet III.	1703
Mahmoud I.	1730
Osman III.	1754
Mustapha III.	1757
Abdul-Hamid.	1774
Selim III.	1788
Mustapha IV.	1807
Mahmoud II.	1808
Abdul-Medjid	1839
Abdul-Aziz	1861
Murad V.	1876
Abdul-Hamid II.	1876
Mohammed V.	1909
Mohammed VI.	1918

TURKEY, in ornithology, any species of the genus *Meleagris*. They are the largest of the game birds, and for that reason have been domesticated for a great length of time. All the species have the head naked, with wattles or folds of bright naked skin, which becomes much more brilliant when the bird is excited or angry, and a curious tuft of long hair on the breast. The plumage is always more or less metallic. The common turkey, *Meleagris gallopavo* is brownish-yellow on the upper parts of the body, and each feather has a broad resplendent black edge, hinder portions of the black feathers and tail coverts dark reddish-brown, striped with green and black; breast yellowish-brown, darkest at sides; belly and sides brownish-gray; rump feathers pale black, with a darker edge; fore parts of head and throat pale sky blue, warts on face



AFRICAN WATER TURKEY

bright red. They often weigh from 20 to 60 pounds, and measure at least three feet in height; but the wild birds are much finer than the domesticated race, which, contrary to the general rule, has degenerated under the care of man. They are gregarious, and inhabit the E. portion of North America, feeding on grass, grain, insects, fruit, etc. The domesticated birds may be seen in every farm yard, and large numbers are bred and fattened. The ocellated turkey, *M. ocellata*, a very fine and brilliantly colored species, having eyelike markings on the tail feathers and upper wing coverts, is found in Honduras and Yucatan. The other species *M. mexicana*, from Central America, Mexico, and the table-lands of the Rocky Mountains, closely resembles *M. gallopavo*, and is popularly known as the Mexican turkey.

TURKEY BUZZARD, or TURKEY VULTURE, the *Rhinogryphus* (*Cathartes*) *aura*. Like the other vultures, they feed on carrion, but their habits vary somewhat with locality; in the southern United States they act as scavengers in the towns; in Guatemala and throughout South America they are not seen in flocks, but occur in pairs only in the forests.

TURKISH BATH, a popular form of hot air bath, in which the patient, after being subjected for some little time to a considerable temperature, is vigorously rubbed down, and is then conducted through a series of cooling chambers till he has regained his normal temperature. All secretions and accretions are thus completely removed from the skin, which is left free to perform its functions healthily.

TURKOMANS, a nomadic Tartar people occupying a territory stretching between the Caspian Sea and the Sea of Aral, the khanates of Khiva and Bokhara, Afghanistan, and Persia. They do not form a single nation, but are divided into numerous tribes or clans.

TURKS, an important and widespread family of the human race; found from the banks of the Lena through central Asia and Asia Minor to the European shores of the Bosporus and the Ægean. Formerly classed among the Turanian peoples, it is now more usual to say that they are of the Mongolo-Tartar ethnological group, and speak languages of the Uraí-Altaic family. To them belong at the present day Yakuts, Siberian Tartars, Kirghizes, Uzbegs, Turkomans, Karakalpaks, Kazan Tartars, and Dungans, as well as the Ottoman Turks; linguistically the Bashkirs and Tchuwashes fall under the same head. The existing Turkish peoples are all Moslems, except the Yakuts, and mostly nomadic. They have given ruling families or races to China, Persia, India, Syria, Egypt, and the empire of the Caliphs.

TURMERIC, the rhizome or rootstock usually having pointed cylindrical branches, of *Curcuma longa* (natural order *Zingiberaceæ*). This species of *Curcuma* is a handsome herbaceous plant, the flowering stem of which has long, narrow, sheathing leaves, and above these a leafy spike of yellow flowers. It is cultivated all over India, but it is also grown in the East Indian islands, China and the Fijis. The tubers, which are yellowish externally, yield a

deep yellow powder of a resinous character. Turmeric has been long employed in the East as a medicine, and as a yellow dye which can be changed into a deep brownish red by alkalies, but neither color is permanent. It is a principal ingredient in some Indian articles of food, including curry powder. In W. countries it is not now much used in dyeing, nor in medicine, but it is very useful as a chemical test for the presence of alkalies, any alkaline substance quickly changing its color from yellow to reddish brown. Mustard is frequently adulterated with turmeric, and so also are some other substances. Turmeric has an aromatic taste and a peculiar odor not unlike that of ginger. The odor is due to an essential oil called turmerol, of which the tubers contain about 1 per cent.; and the coloring principle is known as curcumin. African turmeric, brought from Sierra Leone, is obtained from a species of canna.

TURNER, CHARLES TENNYSON, an English poet; brother of Lord Alfred Tennyson; born in Somersby, Lincolnshire, July 4, 1808. He assumed the name of Turner by royal license, having inherited some property from his great uncle, Rev. Samuel Turner. Besides 'Poems of Two Brothers," written in collaboration with Alfred, he wrote: "Sonnets and Fugitive Pieces" (1830); "Sonnets" (1864); "Small Tableaux" (1868); "Sonnets, Lyrics, and Translations" (1873); "Collected Sonnets, Old and New" (1880). He died in Cheltenham, England, April 25, 1879.

TURNER, FREDERICK JACKSON, an American educator; born in Portage, Wis., Nov. 14, 1861; was graduated at the University of Wisconsin in 1884. From 1885 to 1888 he was tutor in oratory in the university and from 1885 to 1910 professor of history. In 1910 F. J. Turner became professor of history at Harvard. He was the author of "The Indian Trade in Wisconsin" (1890); "Significance of the Frontier in American History" (1893); "The West as a Field for Historical Study" (1896); "Western State-Making in the Revolutionary Era" (1895); "The Origin of Genet's Projected Attack on Louisiana and the Floridas" (1898); "Documents Illustrative of Genet's Proposed Expedition Against Louisiana and the Floridas" (1897); "Dominant Forces in Western Life"; "Rise of the New West" (1906); "Reuben Gold Thwaites" (1914).

TURNER, JOSEPH MALLORD WILLIAM, an English landscape painter; born in London, England, April 23, 1775. Early evincing a marked predilection for art, he, in 1789, entered as a student at the Royal Academy, where he studied assiduously for three years, and produced some of his minor pictures. In 1799, he was elected A. R. A., and, in 1802, became R. A. Down to this period he was principally known as a painter in water-colors. Turning his attention to oils, he, during the next half century, exhibited more than 200 pictures, including some reproductions of nature of marvellous skill and beauty. Among his best works are: "The Wreck"; "The Old Temeraire"; "The Burial of Wilkie"; "The Death of Nelson"; "Ulysses Deriding Polyphemus"; "Crossing the Brook"; "Rome"; "Venice"; "Sun Rising Through a Mist"; "Wreck of the Minotaur"; "Bay of Baiæ"; "Dido Building Carthage"; "Calais Pier," etc. Turner, who has been styled the "English Claude," combined in his works comprehension and truth to nature. As a colorist, Turner ranks among the best painters of modern times. Unsocial and peculiar in his habits—penurious indeed—Turner, in all that related to art, exhibited the most extended munificence. He bequeathed the greater bulk of his large fortune to found almshouses for the benefit of reduced artists, and left his unsold pictures—many of them among his choicest examples—to the British nation. These works, about 100 in number, form the contents of the "Turner Room," in the National Gallery, London. He died in London, Dec. 19, 1851.

TURNIP, a biennial plant, with lyrate hispid leaves; the upper part of the root becoming, especially in cultivation, swollen and fleshy. It is a native of Europe and the temperate parts of Asia, growing in borders of fields and waste places. It is commonly regarded as a native of Great Britain, though in most cases where it is found apparently wild it may be doubted if it has not derived its origin from cultivated varieties. It has been long cultivated, and is to be found in every garden of the temperate and cold parts of the world as a culinary esculent; it is also extensively grown in fields for feeding cattle and sheep. It was cultivated in India long before it could have been introduced by Europeans, and is common there in gardens and about villages. The cultivated varieties are very numerous. In them the upper part of the root assumes a globose, oblong, or roundish depressed form. Some are common to the garden and the farm, and some of the largest kinds attain such a size as to weigh 20 or 25

pounds. Though the turnip is of great value for feeding stock, it is not very nutritious, no less than 90 to 96 parts of its weight actually consisting of water.

Garden turnips are sown from the end of March to the end of August; field turnips generally in June, it being requisite that they should not be sown so soon as to incur a risk of their throwing up flower stems in the first year, which, when it takes place, prevents in a great measure the swelling of the root and renders it coarse and fibrous. In dry weather the plants are apt to throw up flower stems, and so disappoint the hope of the gardener. Moist cloudy weather is most favorable. Garden turnips are sown and allowed to grow much closer than field turnips, being gradually thinned out, and the thinnings used even when of small size. The garden turnips are generally of comparatively small size, more rapid in growth, and more delicate. The Swedish turnip, or ruta baga, which was introduced into cultivation in Great Britain from the N. of Europe, more recently than the common turnip, and has proved of great value to the farmer, is regarded by some botanists as a variety of the same species, and by some as a variety of *B. napus*, but more generally as a variety of *B. campestris*, a species common in cornfields and sides of ditches in Great Britain and the N. of Europe.

The cultivated turnip grows best in a rich free soil. The mode of culture varies with the soil. Where the soil is light and dry a smaller amount of plowing, harrowing, and drilling is necessary than on stiff soils. The turnip is not well suited to clay soils, though it is often grown on them. A complete pulverization of the soil is requisite before the sowing of the seed. On light soils a crop of turnips generally succeeds wheat or oats. Turnip land is generally made up in raised drills by the plow, and the seed is sown by the drilling machine on the top of the narrow ridges, which are about 27 inches wide. Moderate dressings of artificial manure, such as superphopsphate of lime, crushed or dissolved bones, kainit and nitrate of soda, or other such manures, produce great crops of turnips. The more general practice, however, is to give a mixed dressing of farmyard dung and artificial manure. The young plants are thinned out by hand hoe to from 9 to 11 inches apart, and the ground is stirred and carefully kept clean by the plough or horse hoe. The turnip crop is thus of great use in clearing the land of weeds. In many places part of the crop is eaten on the ground by sheep, which are confined to a small part of the field by means of movable fences. It is common to leave one of each three rows of turnips for this purpose, the other two rows being carried into the farmyard for feeding cattle or stored. Turnips are stored either in a house or conical heaps, covered with straw and earth. They are sometimes protected from frost by being earthed up in rows by the plow. Some kinds are much more easily injured by frost than others; the Swedish turnips least of all.

The introduction of the turnip as a field crop is one of the most important events in the history of British agriculture. It has rendered possible a rotation of crops which has been extremely advantageous, and has made the supply of butcher meat more constant, by providing a supply of winter food for cattle and sheep, whereas formerly all depended on the pasture. As a field crop turnips were not raised in Great Britain till the end of the 17th century. Turnip husbandry was introduced into Roxburghshire from Leicestershire about the year 1764, but was soon carried to a perfection in Scotland far beyond what it had previously reached. The climate of Scotland is well adapted for it, as is also that of Ireland. Turnip crops in Great Britain suffer very much from the two distinct diseases called anbury, or club root, and finger-and-toe. Superior culture is the best means of preventing these diseases. Plants weakened by drought are liable also to suffer from a white mould, a species of Oidium, which attacks the leaves and greatly injures the plant.

The turnip crop has to encounter many insect enemies. The most destructive in recent years have been the turnip fly (*Phyllotreta nemorum*, Chevrolat), which devours the young plants before they are strong enough to be thinned. The leaves of the young turnip plants are also attacked and often much injured by the green fly or turnip aphis, *Aphis rapæ* (Curtis); by the maggots of two kinds of Diptera—*Phytomyza nigricornis* (Maquard), the black-leaf miner, and *Drosophila plana* (Fallen), the yellow-leaf miner; by the caterpillar of the diamond-back turnip moth, *Cerostoma xylostella* (Curtis): by the caterpillar of the common dart moth, *Agrotis segetum* (Westwood); by the grubs of the turnip sawfly. *Athalia spinarum* (Fabricius); and by at least two varieties of weevil, Curculio, the most destructive being the little Curculio, *Centorhynchus contractus*, 1-14 inch long, which punctures the seed leaves with its rostrum. The diamond-

back moth fortunately seems to pay its visits of destruction at long intervals. It played great havoc with the crop in England and Scotland in 1891, destroying it beyond recovery in many parts. In Ireland the attack was lighter. Earlier serious attacks occurred in 1851, 1837, and 1826. For all insect attacks the best preventive measure is a dressing of stimulating manure to force on the growth of the plants. Spraying the crop with a mixture hurtful to the insects, by means of the Strawsoniser, an air-power distributor, is also recommended.

TURNSTONE, the *Strepsilas*, a small genus of birds of the plover family (*Charadriidæ*), intermediate between the true plovers and sandpipers. The common turnstone (*S. interpres*) appears in Great Britain as a winter migrant, but is not known to breed there; its breeding places being the shores of the Arctic Ocean in Europe, Asia, and America, though it breeds on the coasts of Scandinavia down to Denmark, laying four eggs of a greenish-gray color, spotted and streaked with bluish-ash and brown, in a shallow depression lined with a few dry leaves and bents. In winter the turnstone is found on the seashore all over the world, being probably the most cosmopolitan of all birds. It derives its name from its habit of turning over stones with its bill in search of its food, which consists of small crustaceans and mollusks. The common turnstone is nine inches in length, and is handsomely marked with black, white, and chestnut; the last-named color is reduced in autumn, when the plumage becomes duller; the legs and feet are orange. Another species, the black-headed turnstone (*S. melanocephalus*), breeds in Alaska and winters in California; and some place the surf-bird (*Aphriza virgata*) in this genus.

TURPENTINE, the name applied to turpentine oil, and to the crude oleo-resinous juice which exudes from incisions in the bark of pines, firs, and other coniferous trees. The species which chiefly furnish common turpentine are *Pinus palustris*, *P. tæda*, and *P. pinaster*. The oleo resin flowing from them has the consistence of molasses, is of a pale-yellow color, with a pungent odor and taste peculiar to itself. It alters much with heat and exposure. Strassburg turpentine is from *Abies pectinata*.

TURPENTINE OIL, the volatile oil distilled from crude turpentine, and existing in the wood, bark, leaves, and other parts of coniferous trees. These oils, according to the source from which they are obtained, exhibit considerable and marked diversities in their physical as well as in their optical properties. The several varieties when rectified are colorless, mobile liquids, having a peculiar aromatic but disagreeable odor. They are insoluble in water, slightly soluble in aqueous alcohol, miscible in all proportions with absolute alcohol, ether, and carbon disulphide. They dissolve iodine, sulphur, phosphorus, also fixed oils and resins. Two principal varieties are from *Pinus maritima*, and from the turpentine collected in the Southern States of America. The former has a sp. gr. of 0.864, boils at 161°, and turns the plane of polarization to the left; the latter has the same specific gravity and boiling point, but turns the plane of polarization to the right. Both oils absorb oxygen from the air, and acquire powerful oxidizing properties from the probable formation of an organic peroxide, $C_{10}H_{14}O_4$. Turpentine absorbs chlorine with such energy as sometimes to set it on fire. It belongs to a group of volatile oils to which the name of terpenes has been given. They are derived from the plants of the coniferous and aurantiaceous orders, yielding, for example, turpentine and lemon oils respectively. Turpentine oil is of great importance in the arts, and is specially employed for giving consistency to oil paints and varnishes, conferring on them drying properties.

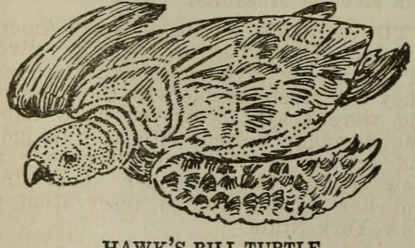
TURPIN, a French clergyman; Archbishop of Rheims, friend and companion of Charlemagne, the supposititious author of the "History of Charlemagne and Roland." According to Gaston Paris, this falls into two parts: the first (1050) dealing in five chapters with Charlemagne's conquest of Spain without reference to Roland; the second (early in 12th century) giving the legend of Roland, the treachery of Ganelon, Roland's heroic death at Roncevaux, and the king's vengeance on the Saracens. In the "Song of Roland" itself Turpin dies beside its hero, and is buried with him and Oliver at Blaye near Bordeaux. There was actually an Archbishop Tilpinus of Rheims (753-800); but there can be no doubt that the romance in its present form was put together in the first third of the 12th century, most probably with a view to the glory of St. James of Compostella. From internal evidence it has seemed to critics highly probable that Pope Calixtus II. either wrote or at least inspired the work himself while yet Guy de Bourgogne, Archbishop of Vienne. Turpin died Sept. 2, 800.

TURQUOISE, an amorphous mineral occurring in reniform nodules and incrustations. Hardness, 6.0; sp. gr., 2.6-2.83; luster, waxy to dull; color, sky-

blue, bluish-green, apple-green; streak, white; rarely sub-translucent, mostly opaque. Composition: Phosphoric acid, 32.6; alumina, 46.9; water, 20.5=100, whence the formula, $2Al_2O_3PO_5+5HO$. Probably the Callais, Callaina, and Callaica of Pliny. A gem stone much used in ancient times in Persia, and in prehistoric times by the ancient Mexicans under the name of chalchihuitl. Originally found in Persia, where the best stones for jewelry purposes are still obtained, through the locality of the Mexican chalchihuitl has lately been discovered.

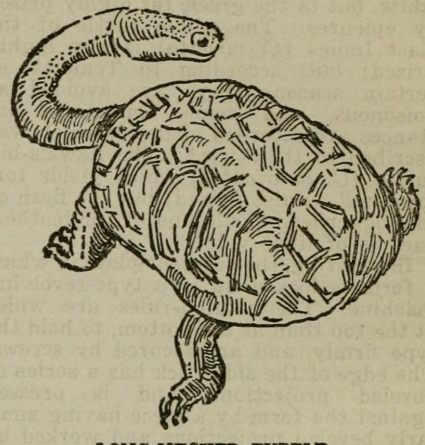
TURRET, in architecture, a small tower attached to and forming part of another tower, or placed at the angles of a church or public building especially in the style of Tudor architecture. Turrets are of two kinds—such as rise immediately from the ground, as staircase turrets, and such as are formed in the upper part of a building by being carried up higher than the rest, as bartizan turrets. In military antiquities, a movable building of a square form, consisting of 10 or even 20 stories, and sometimes 180 feet high, usually moved on wheels, and employed in approaches to a fortified place for carrying soldiers, engines, ladders, etc. In railways, the elevated central portion of a passenger car, whose top forms an upper story of the roof, and whose sides are glazed for light and pierced for ventilation.

TURTLE, in zoölogy, the popular name for any species of the *Chelonïdæ*. They may be distinguished by their long, compressed fin-shaped, non-retractile feet, with the toes inclosed in a common skin, from which only one or two claws project. The carapace is broad and much depressed so that when these animals are on shore, and are turned over on their backs, they cannot regain the natural position. Large interspaces between the extremities of the ribs, and



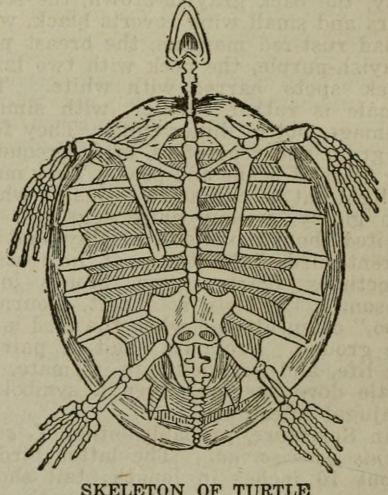
HAWK'S-BILL TURTLE

portions of the sternum always remain cartilaginous, so that the carapace is far lighter than in the tortoises. The head is large and globose, and cannot be retracted within the shell; it is covered above with symmetrical horny shields, and the jaws are armed with sharp, horny sheaths. Turtles are marine



LONG-NECKED TURTLE

animals; their pinnate feet and light shell render them excellent swimmers. They sometimes live at a great distance from land, to which they periodically return to deposit their soft-shelled eggs (from 100 to 250 in number) in the sand. They are found in all the inter-tropical seas, and sometimes travel into the tem-



SKELETON OF TURTLE

perate zones. The flesh and eggs of all the species are edible, though the Indian turtles are less valuable in this respect than those of the Atlantic. The most highly valued of the family is the green turtle (*Chelonia viridis*), from which turtle soup is made. It attains a large size, sometimes from six to seven feet

long, with a weight of from 700 to 800 pounds. The popular name has no reference to the color of the carapace, which is dark olive, passing into dingy white, but to the green fat highly prized by epicures. The edible turtle of the East Indies (*C. virgata*) is also highly prized; but, according to Tennent, at certain seasons they "are avoided as poisonous, and some lamentable instances are recorded of death which was ascribed to their use." The hawk's-bill turtle (*C. imbricata*), which yields tortoiseshell, is also prized; but the flesh of the loggerhead turtle and of the leatherback is of little value.

In printing, the segment plate in which a form is locked up in a type-revolving machine. The column-rules are wider at the top than at the bottom, to hold the type firmly, and are secured by screws. The edge of the side stick has a series of beveled projections, and is pressed against the form by a piece having similarly beveled projections and worked by a screw.

TURTLE DOVE, in ornithology, *Turtur communis*, widely distributed in the warmer parts of Europe. It is a beautiful bird, of somewhat slender form, a summer visitant to the cooler latitudes, arriving in May and departing in September. The male is about a foot long, with the head light bluish gray, the back grayish-brown, the scapulars and small wing coverts black, with broad rust-red margins, the breast pale grayish-purple, the neck with two large black spots barred with white. The female is rather smaller, with similar plumage, but of duller tints. They feed on grain and vegetables, often frequenting fields of beans and peas. They make a slight flat nest of a few twigs, in which two glossy, creamy-white eggs are deposited about the middle of May, and the parent birds take turns at incubation, sometimes rearing two broods in a season. The note is a soft, mournful "coo," often uttered when the bird is on the ground. From its habit of pairing for life, and its fidelity to its mate, the turtle dove has long been a symbol of conjugal affection.

In Scripture, probably either *T. communis* or *risorius*. The latter bird is about 10 inches in length; tail short; general color gray, tinted with red, upper parts greenish brown, with a black collar on the back of the neck.

TUSCALOOSA, a city and county-seat of Tuscaloosa co., Ala.; on the Black Warrior river, and on the Alabama Great Southern, the Louisville and Nashville, and the Mobile and Ohio railroads, 50 miles S. W. of Birmingham. It contains a court house, a lunatic asylum, the Alabama Central Female College (Bapt.), the University of Alabama, the Tuscaloosa Female College (M. E.), the Stillman Institute for Colored Students (Pres.), several libraries, National banks and a number of daily, weekly, and monthly periodicals. It has large cotton and coal interests. Pop. (1910) 8,407; (1920) 11,996.

TUSCANY, formerly a grand-duchy, now a department of Italy; area, 9,304 square miles; pop., about 2,800,000. The chain of the northern Apennines forms a considerable portion of its N. boundary, the sea being its boundary on the W. The principal river is the Arno. Cereals cover a large area, and vineyards, olive yards, and orchards are numerous. The manufacture of silk is considerable. The marble of Tuscany, especially that of Siena, is well known. Tuscany corresponds to the ancient Etruria, which was, however, of wider extent. After the fall of the Western Empire (476) it passed successively into the hands of the Ostrogoths, Byzantine Greeks, and Lombards. Charlemagne made it a Frankish province, and it was governed by marquises or dukes till the 12th and 13th centuries, when it became broken up into a number of small republics, four of which were Florence, Pisa, Siena, and Lucca. From the first Florence occupied the leading place, and it gradually extended its territory. In 1569 Pope Pius I. granted to Cosmo I. the title of Grand-Duke of Tuscany, and this position was retained, with interruptions, by the Medici family till 1737, when it passed to Francis Stephen, Duke of Lorraine. In 1859, under his descendant, the Grand-Duke Leopold, it was annexed to Sardinia by a popular vote, and in 1860 became, with Sardinia, part of the kingdom of Italy.

TUSCARAWAS RIVER, a river of northeastern Ohio, which with the Mohican river forms the Muskingum. It is about 125 miles long. The chief town on this river is Massillon.

TUSCARORA, a tribe of North American Indians, who at an early day lived on the Neuse river in North Carolina. They had much trouble with the colonists and were nearly destroyed as a tribe. The remnant united with the Iroquois and settled in the Oneida territory in New York. They number about 380, and live on the Indian reservation in New York State.

TUSCI, the name given by the Romans to the ancient inhabitants of Etruria or Tuscany, and the people existing when Rome was founded, and till Etruria became a portion of the Roman empire.

TUSCULUM, anciently a city of Latium; about 15 miles S. of Rome; on a ridge of hills known as the Colles Tusculani, and forming part of the Alban range. Octavius Mamilius, ruler of Tusculum, married a daughter of Tarquinius Superbus, and played a conspicuous part in the last of the great struggles made by the banished tyrant to regain his kingdom. But the Latins were so thoroughly beaten at Lake Regillus (496 B. C.) that they were glad to enter into an alliance with the victor, and ever after, except in the Great Latin War (340-338 B.C.), remained steady in their fidelity to Rome. As early as 378 B. C. the inhabitants of Tusculum received the Roman franchise. Toward the close of the republic Tusculum became a favorite country residence of the wealthy Romans; Lucullus, Cato, Brutus, Hortensius, Crassus, Cæsar, and Cicero had villas here. Till 1191 Tusculum continued entire; but it was stormed then by the Romans and ruined forever. Many fine remains of ancient Tusculum have been dug up, the most remarkable being the amphitheater, theater, and city walls.

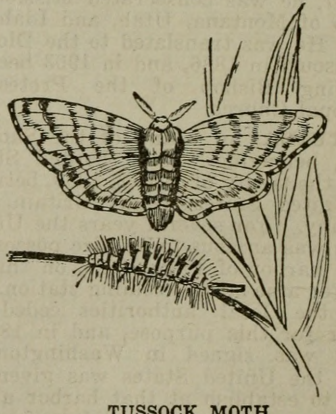
TUSKEGEE NORMAL AND INDUSTRIAL INSTITUTE, a coeducational non-sectarian institution in Tuskegee, Ala., for colored students; founded in 1881; reported at the close of 1919: Professors and instructors, 206; students, 1,736; number of graduates, 2,599; president, Dr. R. R. Moton.

TUSSAUD, MADAME, the foundress of the well-known exhibition of wax-work in London; born (Marie Grosholtz) in Berne, Switzerland, in 1760; learned the art of modeling in wax in Paris. For a time she was engaged in giving lessons in modelling to Elizabeth, sister of Louis XVI., and in this way became acquainted with the leading personages at court. Imprisoned for three months during the Revolution, in 1802 she established herself in London. The collection of over 300 portrait figures (that of Voltaire and others still on view modelled by Madame Tussaud herself from life), with the "Chamber of Horrors," devoted to figures of murderers, instruments of torture, the guillotine of the Revolution, etc., is one of the sights of London. She died in London, April 16, 1850.

TUSSER, TUSSORE, or TUSSEH, the silk spun by the tusser silkworm. The centers of the traffic are in Bengal, the Central provinces, Berar, and the Nizam's country. There are generally two crops of the insect during the year. The cocoons are purchased in May and June by the rearers from those who have collected them from the jungle; the female cocoons are the larger. They are almost perfectly smooth, of a gray color, with darker veins across the outer surface. When mature, the largest are about two inches long by one and a quarter broad, those of average size about an inch and a half long. The inner layer of the fiber is quite loose, forming a soft cushion for the insect within. The silk, when obtained, has a glossy or vitreous look. It is now manufactured in Europe as well as in India, being largely used for cloaks and mantles designed for winter wear. No kind of silk so closely imitates sealskin or is so durable. It is used in the manufacture of Utrecht velvet, and has the rigidity requisite to render it a valuable material for carpets.

TUSSER, THOMAS, an English musician, teacher, and poet; best known as the author of "Five Hundred Points of Good Husbandry"; born in Rivenhall, Essex, England, about 1524. From his rhyming autobiography it would appear that he served as a chorister first at Wallingford Chapel, and afterward at St. Paul's. In rude rustic rhymes, which have hardly a claim even to the name of verse, he inculcated a good amount of sound agricultural wisdom; and the book is still of interest for the glimpses it affords of the country life of the times, as well as for occasional passages of quaint and vigorous expression. The best editions are Dr. Mavor's (1812), Arber's (1870), and the English Dialect Society's (1878). He died in London about 1580.

TUSSOCK MOTH, the *Dasychira pudibunda*, a grayish-white moth about



TUSSOCK MOTH

an inch long, the caterpillars of which do great mischief in hop grounds, and are known as hop dogs. The caterpillar

is delicate green in color, with brush-like tufts of yellow hairs on several of the segments. It feeds on leaves throughout the summer, becomes a hairy chrysalis about September, and emerges as a moth in the following spring. A hard syringing is recommended if the caterpillars are present in large numbers.

TUTICORIN, a town in Madras, British India; near the S. extremity of the peninsula; 70 miles N. E. of Cape Comorin, and 513 S. W. of Madras. In the roadstead here, where ships ride safely 2½ miles from the shore, is conducted all the sea-borne trade of the district. There is a pearl-fishery in the neighborhood. Tuticorin has acquired increasing importance as the terminus of the South Indian railway. Pop. about 40,000.

TUTTIETT, MARY G., pseudonym MAXWELL GREY, an English novelist; born in the Isle of Wight. She wrote: "The Broken Tryst" (1879); "The Silence of Dean Maitland" (1886); "The Reproach of Annesley" (1889); "In the Heart of the Storm" (1891); "Sweethearts and Friends" (1897); "The House of Hidden Treasure" (1898); "The Forest Chapel" (1899); "The Great Refusal" (1906); "The Black Opal" (1918); etc.

TUTTLE, DANIEL SYLVESTER, an American Protestant Episcopal clergyman, born in Windham, N. Y. in 1837. He was educated at Columbia University and the General Theological Seminary, and received honorary degrees from the University of the South and from Washington University. He became a deacon in 1862, and a priest in 1863. After serving as assistant rector and then as rector at Morris, New York, from 1862 to 1867, he was consecrated Missionary Bishop of Montana, Utah, and Idaho in 1867. He was translated to the Diocese of Missouri in 1886, and in 1903 became Presiding Bishop of the Protestant Episcopal Church.

TUTUILA, an island of the Samoan group, belonging to the United States under the treaty of Dec. 2, 1899, between the United States, Great Britain, and Germany. For several years the United States was anxious to acquire possession of the harbor of Pago Pago, on this island, for a naval and coaling station. In 1872 the local authorities ceded the harbor for this purpose, and in 1878 a treaty was signed in Washington by which the United States was given the right to establish at that harbor a station for coaling, naval supplies, freedom of trade, commercial treatment as a favored nation, and extra-territorial consular jurisdiction. This harbor was occupied by the United States in 1898, with the purpose of utilizing its advantages as a coaling and supply station. Tutuila, the island upon whose coast this harbor is located, has a population (1916) of 6,185, and an area of 77 square miles.

TVER, a province of Russia, surrounded by the provinces of Novgorod, Jaroslav, Vladimir, Moscow, Smolensk, and Pskov; area, 24,975 square miles; pop. about 2,500,000. From the Volchonski Forest, a range of thickly wooded limestone hills in the W., offsets running between lakes and swamps intersect almost the whole of Tver. In the Ostashkov district are the headwaters of the Volga, Düna, and Msta. Tver is drained by the Volga and its affluents. The Volga is connected with the Msta by the canal of Vishnij Volotchok, and by the Mologa and the Tichvin canal with the Tichvinka and Sias, which run into Lake Ladoga. There are 100 lakes in Tver, of which the largest are Seliger, Ochvat-Shadenje, and Steresh. One-fourth of the surface is forest. Potatoes and flax are increasingly cultivated. The chief occupations are the cutting and floating of wood, and the preparation of tar, pitch, and turpentine.

TVER, a city and capital of the Russian province of the same name, is on both sides of the Volga at its confluence with the Tverza and the Tmaka, 110 miles N. W. of Moscow. It has fine streets and squares, a former imperial palace, a cathedral, and many churches, several monasteries, a priests' college, a gymnasium, a technical school, a cavalry cadets' school, a teachers' seminary, a ladies' college, several benevolent institutions, and a theater. There were before the World War many factories. Its position on the Petrograd-Moscow railway and on the river Volga gave Tver great transit traffic, which was chiefly in corn and metal wares. Entirely burnt in 1763, Tver was speedily rebuilt by Catharine II., who has here a monument. Pop. about 65,000.

TWACHTMAN, JOHN HENRY, an American landscape painter, born in Cincinnati in 1853. He studied art at the Cincinnati School of Design under Duveneck and at Munich and at Paris, becoming one of the leading exponents in the United States of the impressionistic school of painting. His landscapes were distinguished for their color and for their harmony of form and masses. As subjects for his paintings he chose chiefly the neighborhood of Greenwich, Conn., where he lived, although he painted one series each of Niagara Falls

and Yellowstone subjects. Samples of his work were acquired by most of the important public collections in this country. He died in 1902. In 1913 a lone exhibition of his paintings was held in New York, and an entire room was devoted to his work at the Panama Pacific Exposition, San Francisco.

TWEED, a river of Scotland, which rises in the S. part of Peeblesshire, passes by or near to Peebles, Melrose, Kelso, Coldstream, from near which place it forms the boundary line between England and Scotland for 16 miles, runs through England for a short distance, and then enters the North Sea at Berwick; total length, 97 miles. Its tributaries include the Ettrick, Gala, Leader, Teviot, Eden, and Till. Its waters abound with salmon and trout, and its name is celebrated in connection with some of the best literature of Scotland.

TWEED, a cloth, so called from the name of the river which falls into the sea at Berwick, where it is largely manufactured. It is said, however, that some cloth called on an invoice tweels, or tweeled, that is, woven diagonally, having been sent to London, the word, which was blotted or imperfectly written, was misread Tweed, and as the cloth was manufactured in the valley of the Tweed, and the designation tweed was consequently an appropriate one, it was allowed to stand, even after the error had been detected.

TWEED, WILLIAM MARCY, an American politician; born in New York City, April 3, 1823; began life as a chairmaker; became an alderman; was in Congress in 1853-1855; was chairman of the board of supervisors of New York City in 1856, and school commissioner in 1856-1857. He was twice sent to the State Senate, and in 1870 was appointed commissioner of public works for the city. He had previously been chairman of the general committee of Tammany Hall and grand sachem. As head of the "Tweed Ring," composed of influential and unscrupulous politicians, he succeeded in obtaining control of the funds of the city government and distributed almost unlimited patronage to his friends. He was brought to trial in 1873; convicted on no less than 12 charges of fraud; and was sent to the penitentiary for 12 years. A reversal of his sentence was obtained in 1875, but he was again imprisoned for lack of bail on a series of civil suits. He broke jail and escaped to Spain, but was captured, sent back to New York on a warship, and recommitted to Ludlow street jail, where he died, April 12, 1878.

TWELVE TABLES, the name given to the earliest code of Roman law, civil, criminal, and religious, made by the decemvirs in 451-449 B. C. These, originally comprised in 10 tables, to which next year two others were added, were supposed to form the basis of all Roman law, and in Cicero's time were still committed to heart by boys at school. But they were very far from being a complete system. The occasion for them arose in the constant complaints made by plebeians of oppression by patricians; and the principal aim of the tables was to define rights, fix penalties, and prevent oppression under legal forms. Some of them were based on Greek models; most of them were derived from earlier Roman legislation. Many older laws were left intact by them, and reappear in Justinian's code. To the original tables commentaries were from time to time added.

TWILIGHT, in astronomy, the faint diffused light which appears a little before sunrise, and again for some time after sunset, the amount and duration of the light varying materially in different latitudes and at different seasons. Popularly, the term is only applied to the evening twilight, the morning twilight being called dawn. Twilight is produced by the diffused reflection of light from and among the atmosphere after the direct rays of the sun have ceased to reach the earth. When the sun descends below the horizon, its rays pass through the atmosphere strata, and some of them are reflected toward the earth and illuminate its surface. At first the light, falling on the lowest and densest strata, is reflected in great abundance, but as the sun descends to a greater distance below the horizon, the rays fall on higher, and therefore rarer, atmospheric strata. Consequently fewer rays undergo reflection, and as the number of reflected rays diminishes as the sun descends, the strength of the twilight diminishes in the same proportion, till at last the solar rays fall on strata so rare as to be incapable of reflecting light, and the twilight accordingly disappears. In the morning the change from darkness to light takes place in a similar manner, but in inverted order.

TWILIGHT SLEEP, derived from the German word "dämmerschlaf," an anæsthetic employed in relieving the pain of childbirth, consisting of the hypodermic use of a combination of scopolamine and morphine in solution. It was first used by Drs. Krönig and Gauss in their private hospital in Freiburg, Baden, Germany, but attracted little attention until described in an American magazine

article in 1914, after which it was tentatively used in a number of American hospitals, causing much discussion in the daily press for several months. It is now very seldom employed in this country, and was almost entirely ignored by the medical profession in European countries. Its superiority over chloroform was never obvious. Aside from that, the use of anæsthetics in childbirth is generally deprecated by modern practitioners, the mother's consciousness being required to enable her to assist in the delivery of the child through her own physical efforts.

TWIN-SPOTTED QUAKER, a European night moth, the *Tæniocampa munda*. The wings are gray, with two closely approximate and very conspicuous dark spots on the disk of the fore wings. The caterpillar feeds on the oak.

TWISS, SIR TRAVERS, an English jurist; born in London, England, March 19, 1809; was educated at University College, Oxford. Successively fellow and tutor of his college, a public examiner at Oxford, Professor of Political Economy at Oxford (1842-1847), and of International Law in King's College, London (1852-1855), he became in 1855 Professor of Civil Law at Oxford. In 1858 he became Chancellor of the Diocese of London, in 1862 advocate-general of the Admiralty, Queen's advocate-general in 1867, being knighted that same year. He served also on various royal commissions. He resigned all his offices in 1872, but in 1884 drew up for the Belgian King Leopold II. a constitution for the Kongo Free State, and in 1885 acted as legal adviser to the West African nference at Berlin. Among his most important writings are "View of the Progress of Political Economy Since the 16th Century" (1847); "Lectures on International Law" (1856); "The Law of Nations" (1861); "Law of Nations in Times of War" (1863); "Monumenta Juridica: The Black Book of the Admiralty" (4 vols. 1871-1876), an edition for the Rolls series of the "England's Laws and Customs" of Henry de Bracton (6 vols. 1878-1883), and "Belligerent Right on the High Seas" (1884). He died in London, Jan. 15, 1897.

TYLER, a city and county-seat of Smith co., Tex.; on the St. Louis Southwestern and the International and Great Northern railroads. It contains Tyler College, a court house, public library, the Charnwood Institute, numerous churches, National banks, and a number of daily, weekly, and monthly periodicals. It has fruit-tree nurseries, canning factories, cotton compress, iron rolling mills, and tile and pottery works. Pop. (1910) 10,400; (1920) 12,085.

TYLER, JOHN, an American statesman, 10th President of the United States; born in Charles City co., Va., March 29, 1790. His father was an officer in the army during the Revolution, and a judge of the Federal Court of Admiralty. Tyler was graduated at William and Mary College, in 1807, when but 17, and was admitted to the bar in 1809. At the age of 21 he was elected to the Virginia legislature; and in 1816, at the age of 26, was elected to Congress. In 1825 he was elected governor of Virginia, and in 1827 Senator of the United States. He sustained the States' Rights policy in Congress, voted against the so-called Force Bill empowering President Jackson to enforce the revenue laws in South Carolina, and for the resolutions censuring Jackson for removing the government funds to State banks. When in 1836, the Virginia legislature instructed to vote for the expunging of this censure, he resigned his seat in the Senate. In 1839 he was elected to the Virginia legislature, and in 1840 was elected Vice-President on the Whig ticket with William H. Harrison. On April 4, just one month after entering on the duties of his office, President Harrison died, and Tyler became President by succession. He at once came into conflict with Congress by vetoing financial bills that he believed to be in violation of the Constitution. His cabinet, except Daniel Webster, resigned, and their places were filled by States' Rights Whigs. The most important acts of his administration were a treaty with China and the annexation of Texas (1845). At the expiration of his term he retired to private life, till 1861, when he was made president of a peace convention. Failing in his efforts to effect a compromise, he joined the Confederacy, and served in the Confederate Congress till his death in Richmond, Va., Jan. 18, 1862.

TYLER, MOSES COIT, an American historian; born in Griswold, Conn., Aug. 2, 1835; was graduated at Yale University in 1857; later studied theology; ordained in the Congregational Church in 1859; pastor of the First Congregational Church, Poughkeepsie, N. Y., in 1860-1862; Professor of English Literature in Michigan University in 1867-1872 and in 1874-1881; literary editor of the "Christian Union" in 1872-1874. He became Professor of American History in Cornell University in 1881; was ordained deacon in the Protestant Episcopal Church in 1881, and priest two years later. He was author of "History of American Literature During the Co-

lonial Period"; "Glimpses of England"; "The Brannville Papers"; "The Literary History of the American Revolution"; "Life of Patrick Henry"; "Three Men of Letters"; and "Manual of English Literature." He died in Ithaca, N. Y., Dec. 28, 1900.

TYLER, ROYALL, an American author; born in Boston, Mass., July 18, 1757. In 1794 he was judge of the Supreme Court of Vermont, and in 1800 its Chief Justice. He wrote the first American play to be acted by regular comedians: "The Contrast," produced in 1786 at New York. He also wrote "May-Day: A Comedy" (1787); "The Georgia Spec.; or, Land in the Moon" (1797); "The Algerine Captive" (1799); "Moral Tales for American Youths"; "The Yankee in London"; and contributed many sketches, verses, and essays to various journals and magazines. He died in Brattleboro, Vt., Aug. 16, 1826.

TYLER INSURRECTION, a popular revolt in England during the minority of Richard II., headed by Wat Tyler, a soldier who had served in the French wars, and Jack Straw, an Essex peasant. Its immediate occasion was the imposition in 1381 of a poll tax of three goats on every adult, to defray the cost of the disastrous French war; and the first blow struck was the death of a tax gatherer, who had offered an insult to the daughter of a blacksmith in Essex. From Essex the revolt spread over Norfolk, Suffolk, Sussex, and Surrey, but its strength lay in the 100,000 men of Kent, who marched on London, passing quaint rhymes from man to man, and putting to death every lawyer whom they found. The nobles fled, paralyzed with fear, while the artisans of London flung open the gates of the city. Soon the stately palace of John of Gaunt at the Savoy, the new inn of the lawyers at the Temple, and the houses of the foreign ambassadors were in flames, while a band under Tyler himself broke into the Tower and dragged out and put to death Archbishop Sudbury, the Prior of St. John, and the treasurer and chief commissioner in the levy of the hated poll tax. At Mile End, without the city, the young king met the great mass of the peasants, whom he overawed by his fearless demeanor, and induced them to disperse by promising them charters of freedom and amnesty. However, 30,000 remained with Wat Tyler to watch over the fulfillment of the royal pledge, and this body Richard met by chance next morning at Smithfield. In the conference which ensued, William Walworth, the Mayor of London, exasperated at the insolence of Tyler, stabbed him with his dagger, and in the scene of confusion which ensued, the king, with great presence of mind, addressed the populace, led them to Islington, and commanded them to disperse. The death of Tyler paralyzed the people, while it revived the courage of the nobility. The king, in violation of his pledge, led an army of 40,000 men through Kent and Essex, and spread terror by the severity of his executions, while in Norfolk and Suffolk the revolt was stamped out with the most ruthless cruelty.

TYMPANUM, in anatomy, the drum, middle ear, or middle chamber of the ear; a narrow, irregular cavity in the substance of the temporal bone, placed between the inner end of the external auditory canal and the labyrinth. Its roof is formed by a thin plate of bone, situated on the upper surface of the petrous bone, its floor is a narrow space, its outer wall is formed mainly by a thin semi-transparent membrane—the membrana tympani—which closes the inner end of the external auditory meatus; its inner wall is uneven, its anterior extremity is narrowed by the gradual descent of the roof, and is continued into the Eustachian orifice, and its posterior one has at its upper part a large, and several small openings leading into the mastoid cells. The tympanum receives the atmospheric air from the pharynx through the Eustachian tube, and contains a chain of small bones by means of which the vibrations communicated from without to the membrana tympani are in part conveyed across the cavity to the sentient part of the internal ear.

In machinery, a kind of hollow treadwheel wherein two or more persons walk, in order to turn it, and thus gave motion to a machine. In music, a hand-drum or tambourine, but covered with parchment back and front. It was used in conjunction with various kinds of harps, lyres, and pipes, cymbals of metal, the straight brass trumpet and curved brass horn, the castanets of wood and metal.

TYNDALE, WILLIAM, memorable in the history of the English Bible; born in Gloucestershire, England, about 1484; was educated first at Oxford—at Magdalen Hall, says unvarying tradition—and graduated B. A. in 1512.

In the spring of 1524 he went to Hamburg, probably made his way thence to Wittenberg, next in the autumn of 1525 to Cologne, and there, with the help of a Franciscan friar named William Roye, and another, began with Quentel in 1525 the printing of his English New Testament in an impression of 3,000 copies in quarto size. This had not proceeded beyond the Gospels of Matthew and Mark when the officious intrigues of

Cochlæus forced Tyndale to flee to Worms, where, instead of completing Quentel's unfinished work, Peter Schoeffer printed for him another impression of 3,000 copies in a small octavo size, without prefaces to the books or annotations in the margin.

Tunstall and Warham denounced the book, hundreds of copies were bought up and burned by their authority, but in both forms it made its way by the summer of 1526 to the hearts of Englishmen, and the strong simplicity and homely vigor of its style established a standard of Biblical translation into English, and bequeathed its phrase imperishable to all posterity.

Meantime Tyndale continued to toil indefatigably at the labor of his life. In 1530 he published at Malborow (Marburg) by Hans Luft his version of the "Pentateuch" (reprinted by Rev. J. I. Mombert, 1885), where the marginal glosses, almost all original, contain many violent attacks on the Pope and the bishops, full of rich satire, irony, and even humor. Once again before the end Tyndale revised his Testament (1535), this time without the marginal notes, but with the innovation of headings to the Gospels and Acts, but not the Epistles.

But now it wanted only the crown of martyrdom to consecrate the lifelong devotion of Tyndale to his task. He was arrested and lodged in prison in May, 1535. Tyndale's protracted trial was apparently not begun till 1536; on Friday, Oct. 6, of that year he was first strangled, then burned. Foxe tells us that at the stake he cried: "Lord, open the king of England's eyes!" Eight years before he had written, "If they shall burn me, they shall do none other thing than that I look for . . . There is none other way into the kingdom of life than through persecution and suffering of pain, and of very death, after the example of Christ."

Tyndale's chief original works were "A Parable of the Wicked Mammon" (1527); "Obedience of a Christian Man," his most elaborate book (1528); and "Practice of Prelates" (1530), a pungent piece of controversial polemic, called forth by Sir Thomas More's "Dialogue" (1529), which he met formally with his plain and pointed "Answer" (1531). More followed next year with the first part of his long and intemperate "Confutation," a work unworthy of its author's reputation.

TYNDALL, JOHN, an English physicist; born in Leighlin Bridge, near Carlow, Ireland, Aug. 21, 1820. He studied in Germany; in 1850 published in the "Philosophical Magazine" "Discoveries in Magnetism." He was elected a Fellow of the Royal Society in 1852; Professor of Natural Philosophy at the Royal Institution in 1853, and in 1867 its superintendent. He was the first to climb the Weisshorn, and subsequently reached the summit of the Matterhorn; and published: "Philosophical Transactions in Glaciers of the Alps" (1860); "Mountaineering in 1861" (1862); and "Hours of Exercise in the Alps" (1871). "Heat Considered as a Mode of Motion" appeared in 1863; "Dust and Disease," 1870. In 1872 he lectured in the United States; the profits he devoted as a fund "in aid of students who devote themselves to original research." Besides the works mentioned, he published: "Sound: A Course of Eight Lectures" (2d ed. 1875); "Faraday as a Discoverer" (1868); "Nine Lectures on Light" (1870); "Essays on the Use and Limit of the Imagination in Science" (1871); "The Forms of Water in Clouds and Rivers, Ice, and Glaciers" (1872); "Essays on the Floating Matter of the Air" (1881); and "New Fragments" (1892); besides many others. He received honorary degrees from the Universities of Cambridge and Edinburgh, and was made D. C. L. by Oxford. He died in Haslemere, Surrey, England, Dec. 4, 1893.

TYNE, a river of England, formed by the junction near Hexham of the North Tyne, which rises in the Cheviots, on the borders of Roxburgh, and the South Tyne, which rises at Tynehead Fell, in the extreme E. of Cumberland. The united stream divides the counties of Durham and Northumberland, passes the ports of Newcastle, Jarrow, North and South Shields, and enters the sea at Tynemouth after a course from Hexham of nearly 30 miles. The Tyne has, since 1854, been the subject of large engineering operations, consisting of extensive dredging, the construction of piers at its mouth, the formation of large docks, and the building of a swing bridge at Newcastle. Thus from the sea to Scotswood suspension bridge, a distance of about 10 miles, the river is navigable for large vessels, and the trade on the river, chiefly in coal, has immensely increased.

TYNEMOUTH, the chief watering-place of Northumberland, England; 9 miles E. of Newcastle, occupies the angle formed by the line of the coast and the Tyne. Edwin, King of Northumbria, is said to have founded here, about 627, a church of wood, wherein his daughter Rosella took the veil. King Oswald rebuilt it of stone about 640, and probably established the monastery, which in the

succeeding centuries suffered much from the hands of the Danes. It was refounded in 1090 by Mowbray, Earl of Northumberland. The monastic buildings were dismantled at the dissolution in 1539. The remains of the priory are chiefly those of the church, which was built about 1100 and enlarged about 1220. The chancel, whose E. and S. walls are still standing, is one of the most exquisitely light and graceful specimens of Early English architecture in the country. The Lady Chapel, a chantry of the Percies, was founded toward the close of the 14th century. Tynemouth castle was built about 1296. All that remains of it now is the great gateway of 14th-century date. Tynemouth is a clean, healthy town, with several good streets and terraces. A wide road extends to Cullercoats called the Grand Parade. The sands are nearly a mile long, and the Permian cliffs are very picturesque. Pop. about 60,000.

TYNG, STEPHEN HIGGINSON, an American clergyman, long rector of St. George's Church, New York City; born in Newburyport, Mass., March 1, 1800; and was graduated at Harvard University in 1817. For several years he edited the "Episcopal Recorder," the "Protestant Churchman," etc., and he published in book form many volumes; among them: "Lectures on the Law and Gospel" (1832); "Sermons" (1839-1852); "Recollections of England" (1847); "The Israel of God" (1854); "Christ Is All" (1852); "The Rich Kinsman" (1856); "Forty Years' Experience in Sunday-schools" (1860); "The Prayer Book" (1863-1867). He died in Irvington, N. Y., Sept. 4, 1885.

TYPE, a rectangular solid of metal, wood, or other hard material having a raised letter, figure, punctuation mark, or other character on the upper end, which, when inked, is used to make impressions on paper and other smooth surfaces; the term is also used collectively. Types must be all of a uniform height, and perfectly true in their angles, otherwise they could not be locked firmly together to be printed from. Notches are made on one side of the type to assist the compositor in distinguishing the bottom from the top; the groove is a channel made in the bottom of the type to make it stand steadily. From the character of the letters types are known as CAPITALS, small or lower-case letters, *italics*, script, etc. From their size they receive the following names, from brilliant, which, however, is rarely used, to English, the largest used in ordinary book work: Brilliant, diamond, pearl, ruby, nonpareil, minion, brevier, bourgeois, long primer, small pica, pica, English. The different sizes are now, however, named by the "point" system, as 5-point, 5½-point, 6-point, etc.

Types are made by casting (which is now done by machinery), the letter being first cut on the end of a steel punch, and the punch then driven into a piece of copper, which forms the matrix or bottom of the mold intended to produce the letter. A fount or font is a complete assortment of any given kind of type, the number of each letter being in proportion to the frequence of its occurrence in printed matter, thus:

a	9,000	n	8,000
b	2,000	o	8,000
c	4,000	p	2,400
d	5,000	q	600
e	14,000	r	7,000
f	3,000	s	8,000
g	2,000	t	10,000
h	6,000	u	4,500
i	9,000	v	1,500
j	500	w	2,500
k	800	x	500
l	5,000	y	2,500
m	3,000	z	300

A complete font of type, including Roman and Italic, with capitals, figures, points, and signs, consists of 226 different characters.

TYPE METAL, the alloy of lead and antimony used in casting printers' types, the usual proportions being one part of antimony to three of lead, but a superior and harder kind of type is sometimes made by alloying two parts of lead with one of antimony and one of tin. Both these alloys take a sharp impression from the mold or matrix, owing to their expansion on solidification, and they are hard enough to stand the work of the press, without being brittle or liable to fracture.

TYPE-SETTING MACHINES, mechanical devices for setting type. The first record of type-setting machinery was made in the English Patent Office in 1794. In 1822, W. Church, of Connecticut, took out a patent for a machine having a keyboard, the manipulation of which guided freshly cast type to a central point. Some 20 years subsequently other machines began to appear, among them those of Delacambre, Young, Martin, Boule, Mitchell, Coulan, and Alden. Alden's machine was the first to come into practical use. It was used on magazine work and was able to set about 3,000 ems an hour, but required several men to operate it. The Hattersley machine was produced a little later and was used to some extent. The type was arranged in rows by the manipulations of a keyboard and pushed out by pistons to a guide-plate leading to a central position, where a continuous line was formed.

which was taken in sections by an assistant and spaced into lines of the proper length by hand. The distribution was effected by pushing the type, a line at a time, from an inclined galley, the nicks on the body of the type, different for each character, determining the channel in which each one was deposited. Following these machines came the Burr, afterward called the Empire, and the Thorne. The latter combines the distribution and composition in a single mechanism. The Mergenthaler linotype is incorrectly spoken of as a type-setting machine. It does not set type but matrices, from which a bar called a linotype is cast, this being the equivalent of a line of type. It is worked by a keyboard and has two advantages over other machines; no time is lost upon justification, as the spaces are cast at the same time as the letters, and there is no necessity of distribution. When the matter is done with it is melted up and used over again. The irregularity of the face of the type was at first one of the objections to this machine, but this was corrected. It is in general use in large newspaper offices. The Lanston monotype casts separately each letter, point and sign, including the space. Typesetting by machinery has revolutionized printing, one operator at a machine being able to do the work of four men.

TYPEWRITER, a machine fitted with types which print by a pressure on the keys with the fingers. The principle, briefly stated, is that of a series of rods pivoted to keyed rods, similar to the action of a pianoforte, the ends of the rods carrying the characters of the alphabet and all striking on a common center. There is a self-inking arrangement, and several minor improvements have been added in recent years, bringing the invention to a high state of perfection. It is on record that one Henry Mill obtained a patent in England, Jan. 7, 1714, for such a machine. The record does not describe it, except that it was a device to write in printed characters one letter at a time, one after another. Strange as it may seem, there does not appear to have been another effort made for more than 100 years, for the next record found is that of the "Typographer," the first typewriter invented in the United States, patented by William A. Burt, of Detroit, Mich., in 1829. After this came the English patent of 1841 to Alexander Bain and Thomas Wright, entitled, "A Machine to Print Intelligence at Distant Places." It was designed simply for what is now called the printing telegraph. All printing telegraphs are really nothing more nor less than typewriting machines, and that machine had many of the devices and characteristics of the typewriter. It was not, however, a successful machine, and never came into use. The next record is that of the United States patent to Charles Thurber, of Worcester, Mass., in 1843. Thurber's machine was slow and tedious. The next is that of the patent to Fairbanks, in 1848. It consists of several series or systems of vertical converging rods, the rods of each system adapted to be pushed up vertically, like piston rods, against a common impinging point. On the upper end of each rod was the desired type. The machine was designed for printing colors on cloth, but it really belongs to the typewriting art, and is now properly classed therewith. It, however, was impracticable, and was never used. The next is that of the French patent to M. Pierre Foucault, a blind man in the Paris Institute for the Blind, in 1849. This machine printed embossed letters to be read by the blind. The machine proved a success. Several of them were made and were sent to and used in the blind institutions of Europe. It was exhibited at the World's Fair in London, in 1851, and commanded much attention. The next is the patent of Oliver T. Eddy, of Baltimore, in 1850. No model of this invention can be found. No machine of the kind ever came before the public. In 1852 there was another patent issued; in 1854 another; in 1856 three others, one being to A. Ely Beach, of the "Scientific American," and one to Dr. Samuel W. Francis, of New York, Oct. 27, 1857. After that several other patents were issued in 1858, 1859, 1860, and so on up to 1865 or 1866; but none of these inventions proved to be of much practical value.

The writing machine called the typewriter was invented at Milwaukee, Wis., in 1867, by C. Latham Sholes, Samuel W. Soulé and Carlos Glidden. One device after another was conceived and developed till 25 or 30 experimental instruments were made, each succeeding one a little different from and a little better than the one preceding. They were put into the hands of stenographers—practical persons who were presumed to know better than any one else what would be needed and satisfactory. In this way the invention grew till, at the beginning of 1873, the device was thought complete. The use of the typewriter has completely revolutionized the copyist's trade, and the useful little instrument is one of the most valuable labor-saving devices of modern times.

TYPHOID FEVER, in pathology, a kind of continued fever which is known

by many names. It was called "typhoid" and "abdominal typhus" from its supposed resemblance to typhus or jail fever. It is often known as "low fever" and "slow fever," from its duration; and as "autumnal" or "fall" fever, from the time of the year at which it is most prevalent. The term "enteric fever" was applied to it from the fact that the intestines are always attacked in this disorder; but "gastric fever" is a misnomer, for there is never any organic disease of the stomach. Typhoid fever results from the introduction of a specific poison into the system, and is said to be due to the development of a specific bacillus. It is not contagious, and the poison appears to be communicable only from the discharges. The diffusion of the disease is generally due to the excrement of some patient finding its way into the drains, and thence into wells, or into streams or rivers, the water of which is used for drinking purposes. Hence it is of the highest importance that the excreta of patients suffering from typhoid should be thoroughly disinfected, and, if possible, buried at some distance from any dwelling house; but as in large towns this latter precaution is impossible, disinfectants must be liberally used. In places where the supply of water is from wells, all drinking water should be boiled, and it is a wise precaution during an epidemic to have the milk scalded, as the prevalence of typhoid in London in 1873 was clearly traced to the contamination of the milk by the excreta of a man who had died of typhoid on a milk farm. The period of incubation usually extends over two weeks, being preceded by loss of appetite, languor, headache, dizziness, and bleeding from the nose in many cases.

From the 10th to the 12th day the rash usually appears. It is very slight, and, unless care is taken, may be entirely overlooked. The spots are rose-colored, about the size of a pin's head, disappearing on pressure, but reappearing as soon as the pressure is removed. The patient suffers from debility and diarrhœa, and there is dullness over the region of the spleen, which is enlarged. The stools are of a pea-soup color, and the special lesion observed is enlargement of and deposit in Peyer's glands and the minute solitary glands of the smaller, and sometimes of the large intestine. Sometimes the mental condition is irritable, with illusions and hallucinations, and patients speak in a loud voice and gesticulate wildly. In the third week the symptoms continue with undiminished vigor, and sometimes increase in intensity, with stupor to such a degree that great difficulty is experienced in rousing the patient. In favorable cases, in the fourth week there is a change for the better; the temperature falls, the symptoms are alleviated, the sleep becomes more natural, the motions firmer and less frequent, and the appetite slowly returns. After the 30th day, in the majority of cases, no more spots appear, the fever is at an end, and the patient passes slowly into a stage of convalescence. In typhoid fever relapses are common, and dangerous complications, especially of the lungs, may ensue. If the ulceration of the intestines proceeds so far that they are perforated, death almost invariably follows, and in all cases the mortality is high. The main chance of recovery depends on careful nursing, under the direction of a skilled medical man. The chief treatment consists in reducing the temperature, usually by cold baths or sponging. The fever produces intense thirst, and plenty of fluid should be given. From the ulcerated state of the bowels, solid food must be strictly avoided, beef tea, mutton broth, arrowroot, milk, and eggs being the best forms of nourishment. Stimulants are rarely needed in the early stages of the disease, but may be used with advantage, under medical direction, if the heart's action is weak and the pulse intermittent. Immunization against typhoid fever is conferred by a specific vaccine. This is so effective that during the World War typhoid, formerly one of the worst plagues of war, ceased to be a serious problem. See TYPHUS FEVER.

TYPHON, in Greek mythology, a famous giant who was reputed to be the son of Tartarus and Terra, and fabled to have 100 heads shaped like those of a serpent, and with devouring flames darting from its many mouths and eyes. Typhon, as soon as born, to avenge the death of his brother giants, made war on heaven, compelling the gods to disguise themselves and fly for safety; Jupiter, however, regaining courage, threw off the resemblance of a ram which he had assumed, and, hurling his thunderbolts at the audacious invader, flung him to earth wounded and writhing, when, to prevent his recovery, he cast Mount Etna at his head and buried the rest of his body beneath the island. Through this vast mountain, however, the imprisoned giant still belches forth his fire and smoke, and howls his discordant thunder. In the Egyptian mythology, Typhon is the name given to the Evil Genius.

TYPHOON ("hot wind"), the name given to the violent hurricanes which rage on the coasts of Japan and China and the neighboring archipelago. They

occur from May to November, but especially in July, August, and September, traveling generally from E. N. E. to W. S. W. along the coast of China. In their broad characteristics they resemble hurricanes in other parts of the world, and their tremendous fury is no doubt due very much to the surface conditions under which they are produced.

TYPHUS FEVER, a contagious fever, which occurs mainly in temperate and cold climates, and often rages as an epidemic. It is also known as "spotted," "epidemic," or "contagious" fever, and was formerly called "camp" or "gaol" fever from its prevalence in camps and prisons. It is most prevalent among females and young people, but the highest rate of mortality from the disease occurs among adult males. The contagion is communicated through the air, and probably proceeds from the breath, which has a peculiar foul smell. It is not communicated from the clothes or excreta, and consequently, by properly isolating the patient, the spread of the fever may be prevented. The period of incubation is supposed to range from a few hours to several days.

The earliest symptoms are heaviness and listlessness, with a confusion of ideas, which afterward develops into delirium; an eruption of round, dark, reddish-brown spots then makes its appearance, the temperature is high, the pulse very rapid, and the patient suffers from extreme weakness. The condition of the bowels varies in different patients, for there may be either diarrhœa or constipation. The duration of an uncomplicated case of typhus varies from 12 to 21 days. The greatest danger is usually during the second week of the illness, death seldom ensuing before the seventh day. The treatment of typhus consists in placing the patient under the best possible hygienic conditions, keeping up the strength with beef tea, mutton broth, eggs, arrowroot, etc., and in alleviating the most prominent and distressing symtoms, such as relieving thirst, by the free administration of cooling drinks, controlling sleeplessness, headache, and delirium by small doses of opium, keeping the bowels open by mild laxatives, etc. Stimulants should not be given to children, and many adults do well without them, but alcohol may be advantageously used in the case of old persons, or where the patient has been accustomed to the free use of stimulants. When recovery takes place, it is generally very rapid, a great change in the condition of the patient often occurring in 24 or 48 hours. The only complication at all common is a form of pneumonia. Typhus was one of the scourges of the World War. It followed invasion in Serbia in 1914-1915, and was prevalent in Russia and in southeastern and central Europe in 1919-1920, following pre-war conditions.

TYPOGRAPHICAL UNION, a society of compositors banded together for mutual protection, for the regulation of wages, fixing the number of apprentices allowed to each establishment, the length of time each apprentice must serve in order to become a master workman, and for extending general aid to the members of such association.

With the extension of the printing business in the United States, and especially with the development of newspapers, there arose a necessity for mutual protective associations among compositors and other cognate trades connected with the art of printing. These associations were at first local in their jurisdiction. But the migratory habits of journeymen printers suggested the necessity for an organization that would secure for these nomads the comity and extension of favor and protection which the members of a common craft should always receive from each other. From this necessity arose the International Union, which is composed of delegates from subordinate unions in the United States and Canada. While the International Union is the supreme body, the management of the internal affairs of each union is left almost entirely to the subordinate divisions. Thus each local union may regulate the number of apprentices, the scale of wages for composition, time work, etc. Whenever a member of one local union comes within the jurisdiction of another local body, he at once is subject to the by-laws of the latter. Traveling cards are granted to members, but these cards must be deposited with the local union within the jurisdiction of which its holder proposes to remain for a given length of time, and dues must be paid into the local union with which the card is deposited. There are numerous local unions in the United States, that of New York City being the largest, having a membership of some thousands—followed by Chicago, Philadelphia, Boston, St. Louis, and other large cities of the country. The International Union meets once every year, at different places in the United States or Canada, while the local unions usually hold a meeting each month to transact regular business.

TYR, in Scandinavian mythology, the son of Odin, and the god of war and of fame, which idea is expressed in old Norse by the word *tyr*. According to the Edda, he was single-handed. When the

Asa-gods persuaded the wolf Fenrir to allow himself to be bound with the bandage Gleipnir, Tyr put his right hand in the wolf's mouth, as a pledge that he would be loosened; and when the gods refused to release him, the wolf bit off Tyr's hand to the wrist, which was called, in consequence, *Ulflithr*, or the Wolf's Joint. In the twilight battle of the gods, he meets his death at the same time with his enemy, the monster dog Garmr.

TYRANT, originally, one who obtained supreme or absolute power by usurpation, or who derived it from one who had obtained such power by usurpation, and maintained it by force, though he might exercise his power with strict moderation. Specifically, a monarch, or other ruler or governor, who takes advantage of his power to oppress his subjects or fellow citizens; one who exercises unlawful authority, or legal authority in an unlawful manner; one who acts toward those who are subordinate to him in a manner which law and humanity do not authorize, or which the purposes of government or policy do not require; a despot; a cruel task master; an oppressor.

TYRE, in ancient geography, a famous city of antiquity, on the coast of Phœnicia, 24 miles to the S. of Sidon. The first city of Tyre was built on the mainland, but the second and more important city was erected on an island about a mile long, running parallel with the shore, but separated from it by a strait of the Mediterranean a mile wide. The city covered the whole island, and was of extraordinary magnificence and beauty, while its wealth made it the envy of all surrounding nations. Tyre had two capacious harbors, and the whole island was surrounded by a strong wall 150 feet in height. It was the emporium of all the commerce of the then known world, and the fleets of its merchant princes traded to all parts of the earth. The Tyrians were celebrated for their splendid dyes, especially of scarlet and purple, for their skill in all mechanical arts, their metallic work, industry, and commerce. In the time of David and Solomon, the Tyrian king, Hiram, maintained friendly relations with the Israelites, and his people, as the importers and chief workmen of Solomon, greatly assisted that monarch in the building of his temple.

Tyre is repeatedly mentioned in the Old Testament for its strength, wealth, and beauty, and is threatened with destruction for its pride and grandeur. It was frequently subjected to the horrors of war, endured many long and fearful sieges, and became nominally a tributary state to the Assyrians and Persians. Alexander III. took Tyre after a seven months' siege of extraordinary difficulty, during which he constructed a mole connecting the insular city with the mainland, in July, 332 B. C. Tyre was taken from the Saracens by the Crusaders, after a siege of five months and a half, June 20, 1123. Saladin sought in vain to retake it in 1187. The prosperity of Tyre was not finally destroyed till the conquest of Syria by the Turks in 1516. At present it is a poor town, called Sur, or Soor. It occupies the E. side of what was formerly the island, 1 mile long, and ½ mile from the shore, thus inclosing two so-called harbors separated by Alexander's causeway, which is now a broad isthmus. The only real harbor is on the N.; but even this is too shallow to admit any but the smallest class of vessels. It is filled and the N. coast of the island lined with stone columns, whose size and countless number evince the former magnificence of the famous city.

TYREE, an Argyllshire island; one of the Inner Hebrides; 19 miles N. W. of Iona. Having an area of 34 square miles, it is treeless and flat, with a mean elevation of only 20 feet, except in the S., where three hills attain 400 feet. There are a score of fresh-water lakes. Nearly 40 Scandinavian forts dot the shores, and there are also a ruined castle, nine standing stones, etc.

TYRNAU, a town of Hungary, on the picturesque Waag Valley railway, about 30 miles N. E. of Pressburg. "Little Rome" it used to be called, and not inappropriately, when it was the place of residence of the Hungarian primates. Its university (1635-1774) was transferred to Pest.

TYROL, a crown-land of the former Austrian empire; now a part of the Republic of Austria and of Italy; between Bavaria on the N., Switzerland on the W., Italy on the S., and Salzburg and Carinthia on the E.; and embracing an area of 10,302 square miles, to which is administratively added Vorarlberg, 1,005 square miles, on the W. frontier; pop. before the World War about 1,000,000. The province is traversed from E. to W. by the three chains of the Alps; the central chain (11,000 to 12,500 feet), which is crossed by the road over the Brenner Pass (4,588 feet), the principal line of communication between Italy and Germany, separates the German from the Italian side. The people are noted for their fidelity to the Catholic faith and their devotion to their country, but are somewhat backward in education. The romantic mountain scenery attracts thousands of visitors. The more impor-

tant valleys are formed by the river Inn (flowing N. to the Danube) and the Adige (going S. to the Adriatic), and their tributaries. Pastoral pursuits furnish the chief occupations, though some grain is grown and considerable attention is paid to the cultivation of the forests (46 per cent. of the area), of fruit, wine (5,720,000 gallons annually), and silkworms. The mines were formerly of great value, but little is now extracted, except of salt (at Hall), anthracite, and a little iron.

Tyrol, the ancient Rhætia, was conquered by the Romans under the Emperor Augustus. After the fall of the empire it was occupied by the Boiardi (Bavarians) and Langobardi. During the Middle Ages the most important rulers in Tyrol were the counts of Tyrol and the bishops of Trent and Brixen. In 1363 the counts bequeathed their possessions to the Duke of Austria, and they have formed an appanage of the House of Hapsburg ever since, except during the short period 1806-1814, a period made memorable by the patriotic resistance of Andreas Hofer and his associates to French and Bavarians. As a result of the World War southern Tyrol became part of Italy through the Peace Treaty of St. Germain.

TYRONE, a borough of Pennsylvania, in Blair co., about 15 miles N. E. of Altoona, on the Pennsylvania railroad and on the Little Juniata river. The city is an important railroad junction with large repair shops. There are manufactories of paper products, planing mills, and candy and chemical factories. The city is also important from a commercial point of view, as a result of its proximity to the Clearfield coal fields. A few miles from the town is the Birmingham Female Seminary. Pop. (1910) 7,176; (1920) 9,084.

TYRONE, HUGH O'NEIL, EARL OF, an Irish rebel; born in Ireland, about 1540; was the son of an illegitimate son of Conn O'Neil, the 1st Earl of Tyrone, and was himself in 1587 invested with his grandfather's title and estates. But he soon plunged into intrigues both with the Irish rebels and with Spain against the authority of Elizabeth, and in 1597 assumed the ancient title of "The O'Neil," and began the struggle openly. His success soon spread the flame of insurrection over all Ulster, Connaught, and Leinster. The queen sent over Essex with more than 20,000 men, and at Ballyduich Tyrone met him under the truce, and submitted his demands to Elizabeth. Lord Mountjoy soon succeeded Essex, and quickly subdued the most of the country. But at length in 1601 a Spanish force of 5,000 men landed at Kinsale, and 2,000 more at Castlehaven. Mountjoy at once besieged Kinsale, while Tyrone advanced to its relief, but was defeated with heavy loss, and severely wounded. Mountjoy pursued him to the N. and ravaged his country. After Kinsale fell Tyrone made his submission at Mellefont and was reinstated in his earldom. But under James I. he intrigued anew with Spain, and finally in 1607 found it necessary to flee. His lands were confiscated, and he himself died in Rome in 1616.

TYRWHITT, THOMAS, an English classical scholar; born in London, England, March 29, 1730. Among his works are: "Observations on Some Passages of Shakespeare" (1766); a celebrated edition of Chaucer (1773); editions of Isæus' "Orphica" and Aristotle's "Poetics"; critical dissertations on Barbius, Euripides, Aristophanes, and Strabo. He was the original editor of "Rowley's Poems." He died in London, Aug. 15, 1786.

TZE-HSI, TZU-HI, or **TZI-HI**, a celebrated empress of China, born in Peking, in 1835. She was known as the Great Empress Dowager, and ruled China for half a century. The name of her family was Hweicheng, belonging to the Nara or Nala clan, from which she derived the name of Yehonala. When sixteen she entered the harem of the Emperor Hien-Fung, and started as a kweijen or concubine of the fifth rank. Her talents and striking beauty brought her to the fourth rank in 1854; in 1856 she rose to the third rank, and in 1858 she was second only to Tze-an, who acted as imperial consort on the death of the emperor's legal wife. On April 29, 1856, she gave birth to a son, afterward the Emperor Tung-chih, and later she was known as the Empress of the Western Palace. On the death of Hien-Fung she frustrated a plot intended to bring about her removal and with Tze-an, Empress of the Eastern Palace, attained to power. When her son became emperor (1861-1875) her power increased, and it was maintained when Kwang-su, his successor, married her favorite niece, Yehonala. Her political advisers were first Li Hung Chang, and later Yuan Shikai. Her most difficult period was following the Chino-Japanese war (1894-95), when one foreign power succeeded another in forcing concessions. Her policy was always in favor of absolute power, but she was compelled to yield before she died to liberalizing and modernizing measures. She died November 15, 1908, a day after Kwang-su, designating Pu-yi, son of her nephew, as successor.

U

U, u, the 21st letter and the 5th vowel of the English alphabet. It is one of the three primitive vowels, from which the various vowel sounds in the Aryan languages have been developed. Its true primary sound was that which it still retains in most of the European languages, viz., that of oo in cool, tool, wood, etc., corresponding to the French ou, as in *cour, tour,* etc., the sound being sometimes short and sometimes long. The Anglo-Saxon ú (marked with an accent) has commonly become in modern English the dipthong ou or ow, as Anglo-Saxon *thú*=thou, *nú*=now, *múth*=mouth, etc. After r, and after the sounds sh and zh, u has generally retained its old long sound, as in rule, truth, etc. In Anglo-Saxon *rúm*=room, *brúcan*=brook (v.) the original long sound is retained, though the form is altered. The old short sound of u is still retained in bull, full, pull, put, etc., but as a rule this sound became changed (probably about the middle of the 17th century) to the sound heard in cut, tun, fun, etc. (marked ŭ), a sound then new to English, not being mentioned by any writer before 1653. This sound, which is very similar to that of the unaccented French e, is characteristic of English, and is often given to the vowels a, e, when unaccented, as in cavalry, camel, etc. It is also given to the vowel o, even when accented, as in money, come, honey, among, etc. A modified form of it often occurs before r, as in bur, cur, fur, etc., and sometimes rr, as in knurr, purr, etc. (marked ŭ). This sound is sometimes given to a, i, o, and y before r, as in auricular, her, fir, work, martyr. In the 16th or 17th century arose the practice of using gu to represent a hard g before an e, as in guess, a French practice, borrowed from qu; and to this, and the wish to indicate a long vowel by a final e, must be attributed plague, vague, fatigue, rogue, etc. The final -gue does not, however, always indicate a preceding long vowel; cf. epilogue, synagogue, tongue, etc. The use of u for w in persuade, etc., is modern, also imitated from its use in qu. The long sound of u, as in mute, duke, confuse, etc. (marked ū), and modified by r, as in cure, pure (marked ü), is not a simple vowel, an i sound being more or less distinctly introduced before it, or fused with it. The corresponding short sound is heard in unit, unity, etc. In some dialects in the United States, this sound is also sometimes given to us after r. Duke is sometimes vulgarly pronounced with the same sound, as dook. The original sound of short u is now only retained in bury, burial, busy and business. The long sound of u, as in mute, is also represented by other combinations, as by -ue, in due, sue, etc.; by ew, in dew, flew, etc.; and by ui in suit. Ue is used in later spelling as a final u, owing to a rule made by no one knows whom, no one knows why, and no one knows when, that no English word can end in u. In the 13th and 14th centuries ue=French *eu.* Ui has several sounds: (1) ū, as in suit, fruit, etc.; (2) = ĭ, as in build, guild; (3) ī, as in guide; (4) î, as in mosquito; (5) wi, as in anguish, languid. In buoy, buy, buyer, buying, etc., the u is silent, as also in plaguy. In the best period of Roman literature the u sound was expressed by the character v, a character which did not exist in the Anglo-Saxon alphabet, its sound, when it occurred between two vowels, being represented by i or occasionally by u. In later times u and v stood indifferently for either sound, the capital being generally written V. In this respect U and V stand to each other as I and J. In almost all English dictionaries, up to a comparatively recent date, words beginning with U and V were combined. In printing, where the sheets are marked by the letters A, B, C, etc. (standing for 1, 2, 3, etc.), the signs J, V, and W are ignored, so that, for this purpose, the letters of the alphabet are only 23. In respect to its order in the alphabet, its

form, and its history in general, U corresponds with the Greek *upsilon*. Greek words containing the diphthong ou, when Latinized, were spelled with a u; while Greek words with u, when Latinized, were spelled with y.

U as an initial is used for United, as in U. S. United States; U. S. A. United States of America, and United States Army; U. S. N. United States Navy; U. K.=the United Kingdom; U. P. United Presbyterian (Scotch); U. C. or A. U. C. in dates belonging to Roman history is a contraction for *Ab urbe condita*=from the building of the city (of Rome), as U. C. 400=in the year of Rome 400.

U as a symbol is used, in chemistry, for uranium.

UAUPÉS, a river in Brazil, the largest tributary of the Rio Negro; length about 700 miles.

UBALDINI, PETRUCCIO, an Italian historian; born in Florence, Italy, about 1524. He wrote: "Life of Charlemagne" (1581); "Description of Scotland and Its Isles" (1588); "Lives of Illustrious Ladies of England and Scotland" (1591); "Precepts, Moral, Political, and Economic" (1592). He died in London, England, about 1600.

UBANGI, a river in Kongo Free State; a tributary of the Kongo river, into which it flows a little S. of the equator. It is about 1,500 miles long.

ÚBEDA, a town of Spain; on a plateau between the Guadalquivir and Guadalimar; 26 miles N. E. of Jaén. It contains a large castle, and manufactures cloth, soap, and leather. A flourishing town under the Moors, it witnessed the victory in 1210 of the kings of Navarre and Castile over Abdallah Mohammed of Morocco. Pop. about 25,000.

UBERTI, FAZIO (or **BONIFAZIO**) **DEGLI** (ö-bār'tē), an Italian poet; born in Pisa, Italy, between 1305 and 1309; was a grandson of Uberti, one of the Florentine leaders of the Ghibelline faction, and was driven into exile by the Guelphs. He wrote an unfinished descriptive poem called "The News of the World," which was quite celebrated, and a poem, "Ditta-Mondo," in imitation of Dante's "Divina Commedia." He died after 1368.

U-BOATS. See SUBMARINE.

UCAYALI, a river of eastern Peru; one of the main affluents of the Amazon, of which it was formerly regarded as the head stream. This honor is now accorded, however, to the Marañon, which, though shorter than the Ucayali, is twice as broad as the latter at their confluence. The Ucayali rises in the mountains of southern Peru, some of its feeders having their sources only 150 miles from the Pacific on the one hand, and 100 miles from Lake Titicaca on the other. In its upper course it is known as the Apurimac, and below the junction of the Mantara, in lat. 12° S., it is called the Tambo. After receiving the united waters of the Urubamba and Camisea in lat. 9° S., it becomes known as the Ucayali. Its entire course is about 1,500 miles. The Ucayali has been navigated by steamers for a great part of its course, and a steamer has penetrated by the Pachitea, a tributary on its left bank, to within 220 miles of Callao. The Apurimac is not navigable; but with this exception, and that of a fall on the Lower Urubamba, the Ucayali and its principal tributaries are most valuable highways to the heart of a region abounding in vegetable and mineral wealth.

UCCELLO, PAOLO DI DONO, an Italian painter; born in Florence, Italy, about 1397. He was the first to develop the principles of perspective. His works were principally in fresco, and are numerous in Italian cities. He died in Florence, Dec. 11, 1475.

UCHARD, MARIO, a French author; born in Paris, France, Dec. 28, 1824. Among his dramatic compositions are: "The Husband's Return" (1858); "Second Youth" (1859); "A Burgomaster's Prosperity" (1864); "The Charmers" (1864). His novels include: "Raymond" (1862); "Gertrude's Marriage" (1862); "Countess Diana" (1864); "A Last Passion" (1866); "My Uncle Barbasson" (1876); "My Cousin Antoinette" (1891). He died in Paris, July 31, 1893.

UDAIPUR, or **MEWAR**, a native state of Rajputana, British India; area, 12,753 square miles; pop. about 1,400,000. The capital is Udaipur (sometimes spelt Oodeypore), picturesquely situated on a ridge overlooking a romantic lake, 140 miles S. S. W. of Ajmere. Pop. about 50,000.

UDALL, NICHOLAS, an English author; born in Hampshire, England, in 1505 or 1506; was educated at Oxford; chose the profession of a schoolmaster; and in 1534 passed M. A. and obtained the post of headmaster of Eton, which he held till 1541, when he was dismissed. He afterward resigned the vicarship of Braintree in Essex, which he had enjoyed along with his mastership; but continued both to teach and preach, and in 1551 was admitted a prebendary of Windsor, and in 1554-1555 appointed

headmaster of Westminster school. His comedy of "Ralph Roister Doister," which was probably written for the Eton boys, is a perfectly harmless piece, with a fair amount of vicacity in its execution and ingenuity in its plot, the hero being led into various awkward situations in the course of his suit to Dame Constance, partly by his own stupidity, and partly by the malicious suggestions of Mathew Merrygreek. The play is in rhyme, and has 13 dramatis personæ. Hallam notices that the choice of a city-gallant for "hero" probably determined in some measure the prevalent subject of English comedy all through the Elizabethan age. The exact date of its composition has not been determined; it is quoted in the 3d edition of Sir Thomas Wilson's "Rule of Reason" (1533). There is but one copy of his comedy in existence, having no title page; but it was probably printed in 1566. It is now in the library of Eton College. This is accepted as the first English comedy. Other productions of Udall's pen: "Flowers are for Latin Speakynge" (portions of Terence done into English, 1433), translations of parts of Erasmus' paraphrase of the New Testament, and of Peter Martyr's tract on the Eucharist, and a few Latin letters and poems. He died in Windsor in 1556.

UDINE, a walled town of Italy; capital of a province; in a rich wine country; 85 miles N. E. of Venice. It has wide, handsome streets, and contains a Romanesque cathedral, an archbishop's palace, a beautiful campo santo, and, on a hill in the midst of the city, a castle, formerly the residence of the patriarchs of Aquileia. Udine manufactures silk, leather, gloves, hats, etc. Bonaparte resided in the doge's castle at Passariano, close by, during the preliminaries of the peace of Campo-Formio. It was an important naval base in the World War. Pop. about 45,000.

UDINE, GIOVANNI DA, an Italian painter; born in Udine, Italy, Oct. 27, 1487; studied art in Venice under Giorgione and subsequently settled in Rome. He there assisted Raphael in his work of decorating the loggie and Sala dei Pontifici in the Vatican. He became especially known for his graceful productions and also because he was the originator of the grotesque decorations in stucco. He afterward painted the standards for Saint Angelo castle and then worked in the sacristy of San Lorenzo. He died in Rome in 1564.

UEBERWEG, FRIEDRICH, a German philosopher; born in Leichlingen, Rhenish Prussia, Jan. 22, 1826; studied at Göttingen and Berlin; and, after teaching in a school at Elberfeld and lecturing at Bonn University, became in 1862 professor at Königsberg. He is best known by his "System of Logic" (1857; 5th ed. 1882; Eng. trans. 1871) and his "History of Philosophy" (1863-1866; 7th ed. 1886-1888; Eng. trans. 1872), a compendious handbook from an empirical and eclectic standpoint. He gained the Vienna Academy's prize for an essay on the authenticity and order of Plato's works, and an essay on Schiller as historian and philosopher was published posthumously. He died in Königsberg, June 9, 1871.

UECHTRITZ, FRIEDRICH, a German author; born in Görlitz, Germany, Sept. 12, 1800. Among his tragedies are: "Rome and Spartacus," and "Rome and Otto III." (1823); "Alexander and Darius" (1827); "The Sword of Honor"; "Rosamund" (1833). His dramatic poem "The Babylonians in Jerusalem" (1836) is notable for elevation of thought and lyric grandeur. Among his novels are: "Albrecht Holm" (5 vols. 1851-1853); "The Bride's Brother" (3 vols. 1860); and "Eleazar" (3 vols. 1867), a story of the great Jewish war. He died in Görlitz, Feb. 15, 1875.

UFA, a province of Russia; separated in 1865 from Orenburg; area, 47,112 square miles; pop. about 3,000,000. On the E., where it is bordered by the southern Urals, the country is mountainous, wooded, provided with excellent pastures, and rich in minerals. It is also well watered by the Bielaya, and has abundance of arable land on which good crops are raised. Ufa, the capital, is on the Bielaya, at the confluence of the Ufa, 735 miles E. by N. of Moscow. It is the see of a bishop, and has considerable manufactures and trade. Pop. about 100,000.

UGANDA PROTECTORATE, a British protectorate in east Africa; extending along the N. W. shore of the Victoria Nyanza, and lying on both sides of the equator; area 121,437 square miles; pop. about 3,000,000. It was first visited (in 1862) by Speke and Grant, and by Stanley was called the "Pearl of Africa." The country is partly mountainous, partly undulating, partly in plain, very fertile on the whole, and well wooded. The climate is mild and singularly uniform throughout the year, the variation being from 50° to 90° F. The Waganda are a warlike and highly intelligent people speaking a language of the Bantu stock, with well-developed native industries. At the request of King Mtesa, English Protestant missionaries

settled here in 1877, and French Catholics followed in 1879. The Christians had much to endure from Mtesa's son, King Mwanga, by whose orders Bishop Hannington was murdered in 1885 on the borders of Uganda, and hundreds of Christians were burned. The presence of Arabs and Mohammedanism further complicated matters, and intestine struggles were not long in breaking out. Dr. Peters tried to extend German influence hither, but the Imperial British East Africa Company regarded Uganda as being within the British sphere under the Anglo-German agreement of 1887, and that it was so settled between England and Germany in 1890. In 1892 a war broke out between sections of the people calling themselves respectively Protestants and Catholics. In 1896 Great Britain bought out the rights of the Imperial British East Africa Company, and Uganda became a British protectorate under a resident commissioner. There are several railroads in the protectorate. In recent years there has been considerable commercial and agricultural development. Cotton is grown extensively and is the chief product. Coffee, peanuts and hides are also exported.

UGOLINO, COUNT OF PISA, an Italian leader, who deserted his party, the Ghibellines, and with the hope of usurping supreme power in Pisa formed an alliance with Giovanni Visconti, the head of the Guelphic party, who promised to supply him secretly with soldiers from Sardinia. The plot was found out, and both were banished. Giovanni died, but the latter joined the Florentines, and forced the Pisans to restore his territories. In 1284 Genoa made war against Pisa, and Count Ugolino treacherously deserted the Pisans, causing their total overthrow. At length a conspiracy was formed against him, and in 1288 he was cast with his two sons and two grandsons into the tower of Gualandi, where they were all starved to death in 1289. Dante, in his "Inferno," has given the sad tale an undying interest.

UHLAND, JOHANN LUDWIG, a German poet; born in Tübingen, Germany, April 26, 1787; studied at Tübingen University; practiced law in Stuttgart; was elected a member of the Württemberg Assembly in 1819, and as a politician was ever an advocate of liberal opinions. He was Professor of German Literature at Tübingen in 1829-1832, and latterly lived in studious retirement at Tübingen. His European fame rests on his lyrics and ballads, though he also wrote dramas, etc. He died in Tübingen, Nov. 13, 1862.

UHLICH, LEBERECHT, a German church reformer; born in Cöthen, Germany, Feb. 27, 1799. He founded the independent ecclesiastical organization styled "Free Parishes." Among his writings are: "Christianity and Church" (2d ed. 1846); "The Little Book of the Kingdom of God" (1845); "Thrones in Heaven and on Earth" (1845). He died in Magdeburg, Germany, March 23, 1872.

UIST, NORTH, an island of the Outer Hebrides, 17 miles long, and from 3 to 13 miles broad, separated from Harris by the Sound of Harris. The surface is chiefly flat, the coast greatly broken by inlets from the sea, and the principal industry is fishing.

UIST, SOUTH, separated from the foregoing by the island of Benbecula, is 22 miles in length and 7 miles in breadth. The surface is low-lying in the N., but the remainder is mountainous.

UJIJI, a town in the African Congo. It is situated on the eastern shore of Lake Tanganyika, and is connected by a railway, of which it is one of the termini, with Dar-es-Salaam on the coast, 743 miles distant. It was formerly noted as a center of the slave-trading that flourished in that region. Stanley discovered Livingstone near the town after he had made his great search for the explorer ending in 1871. Pop. about 9,000.

UKASE, an edict or order, legislative or administrative, of the Russian Government under the Czars. It had the force of law till annulled by subsequent decisions or orders. A collection of the ukases issued at various times, made by order of the Emperor Nicholas in 1827, and supplemented since, year by year, constituted the legal code of the Russian empire. An edict or order, generally, issued by some competent authority.

UKRAINE, meaning literally "the frontier region," including a large part of southern Russia, eastern Galicia, northwestern Bukovina and northeastern Hungary. The portion included in southern Russia is also known as Little Russia. The people are quite distinct in character and in their speech from the Big Russians of Moscow and Petrograd, this difference being noticable even in their literature, of which the writings of the famous Gogol are the most representative. The inhabitants of those parts of the Ukraine included formerly under Austria-Hungary are known as Ruthenians, of which many have emigrated to the United States.

The Russian Ukraine declared its separation from Russia in the fall of 1917, and in January, 1918, during the Ger-

man-Russian peace negotiations at Brest-Litovsk, was represented by a special delegation which the Germans favored against the Bolsheviki. By the terms of the Brest-Litovsk Treaty the Ukraine was recognized by both the Bolsheviki and the Central Empires as a separate state, under German suzerainty, and under the dictatorship of Skoropadski, a pro-German. After the collapse of the Balkan front of the Central Empires, in the fall of 1918, the Germans were compelled to withdraw their forces in the Ukraine, Skoropadski fled, and a pro-Ally government was established. Beginning at that time, however, the Soviet Government of Moscow initiated a campaign against the Ukraine and gradually overran the territory until, in 1920, after the final defeat of the anti-Bolshevist leader, Denikin, the Ukraine was again completely reunited to Russia, save for a brief period during the summer of 1920, when Kiev was temporarily occupied by the Polish army of invasion.

ULADISLAS or **VLADISLAS**, the name of seven kings of Poland:

ULADISLAS I., duke or king, succeeded his brother, Boleslas, in 1081 or 1082; his reign was troubled with civil and foreign wars; died 1102 or 1103.

ULADISLAS II., succeeded his father, Boleslas III., in 1138 or 1139; he was deposed 1146, and died in exile in 1159.

ULADISLAS III., was elected king 1202, and deposed in 1206 on account of his cruelties; died 1233.

ULADISLAS IV., surnamed Loketek, became master of the kingdom in 1296, was deposed by the states, and Wenceslaus elected in his room, 1300, but was restored on the death of the latter in 1305 or 1306. He sustained a war with the Teutonic knights, and died 1333. His son, Casimir III, called The Great, succeeded him.

ULADISLAS V., Grand-Duke of Lithuania, obtained the crown by marrying Hedwiga, daughter of Louis. He was succeeded by the son, Casimir IV.

ULADISLAS VI., son of Casimir IV., is the same as Ladislas VI., King of Hungary.

ULADISLAS VII., son of Sigismund; born 1595, and succeeded his father 1632. He had previously sustained a war with the house of Romanoff, and afterward, in 1633-1634, he conquered the Turks and Tartars of the Crimea.

ULCER, a word derived from the Latin *ulcus*, a "wound." Ulcers may be arranged either according to the constitutional or specific disease from which they are derived, or according to the characters which they present. According to the first system ulcers are spoken of as healthy, inflammatory, strumous, etc.; while according to the second they are named irritable, chronic, sloughing, etc. In this article the former of these arrangements is adopted as being, on the whole, the most satisfactory, though each possesses its own advantages. A common, simple, or healthy ulcer is such as is left after the separation of an accidental slough in a healthy person, and is merely a healthy granulating surface tending to cicatrization. Its edges shelve gently down to the base, and are scarcely harder than the adjacent healthy skin. Their surface near the borders is of a purplish blue tint where the young epidermis modifies the color of the healing granulations and within this the granulations have a deeper hue than those at the center, being most vascular where the cuticle is being chiefly developed. The discharge from such an ulcer is healthy or "laudable" pus. The only treatment required is a little dry lint, if there is much discharge, or the water dressing; if granulations are too luxuriant they must be touched with nitrate of silver and dressed with dry lint.

Inflammatory ulcers differ less than most kinds from the above described common or healthy ulcers. They commonly arise from some trifling injury, such as a blow or slight abrasion of the skin, which to a healthy person would have done no harm. Their most common seat is on the lower half of the leg or shin. The surface is red and bleeds easily; the discharge is thin and watery; the edges irregular or shreddy, and the surrounding skin shows a red tinge, and is the seat of a hot and aching sensation. This ulcer most commonly occurs in the infirm and old, the ill-fed, and overworked. Hence constitutional treatment, good diet, and complete rest (with elevation of the limb) are here demanded in addition to water dressing or lead lotion applied warm. Senile ulcers usually present very little discharge, exhibit granulations of a rusty red tint, and are surrounded by a dusky red area. Nourishing food, wine, bark, and the mineral acids are here required, and opium in small repeated doses is often serviceable. The local treatment must be of a stimulating nature, and in bad cases Sir J. Paget recommends strapping the leg daily with a mixture of resin ointment and Peruvian balsam spread on strips of lint. Strumous or scrofulous ulcers usually occur as the consequence of scrofulous inflammation in the subcutaneous tissue or lymphatic glands. They most commonly occur in the neck, groins, cheeks, scalp, and the neighborhood of the larger joints. The discharge

is thin and of a greenish-yellow tint. These ulcers are seldom very sensitive or painful. The general treatment must be that recommended for constitutional scrofula. Iodine in some form or other is the best local application. A poultice of bruised and warmed sea weed is a very popular remedy; but there is probably nothing so efficacious as tincture of iodine diluted with water till it causes only a slight discomfort, and applied three or four times a day (about 30 drops of the tincture may be added to an ounce of water to begin with).

ULEABORG, or **OULU**, a seaport town of Finland; capital of the province of the same name; on the S. bank of the Ulea, near the head of the Gulf of Bothnia. It was founded in 1605, and the privileges of a port were granted to it in 1715. In 1822 it suffered severely from fire. The harbor has become so shallow that vessels are obliged to unload in the roadstead, 4 miles from the town. In 1854 an English flotilla burned the government property in the place. Pop. about 22,000.

ULEMA, the collective name (which cannot be used as a singular) of the body of professional theologians and doctors of divinity, and therefore of law, in any Mohammedan country. They form the legal and judicial class, and interpret the Koran and the law derived therefrom; they also constitute whatever there is of the nature of a hierarchy in Islam, and their power and influence have often curbed the irresponsible authority of a despot. There are necessarily ulema in every Mohammedan city, but the most renowned are the ulema of Constantinople, of Mecca, and of the Azhar university at Cairo. The ulema of Turkey are the best organized, and possess many privileges and immunities. They include (apart from the "softas," who are a species of undergraduates training for the rank of ulema) the "imâms" or readers of the public prayers at the mosques; the "muftis" or doctors of the law, who act partly as barristers, partly as assessors in the courts; and the "kadis" or "mollas," who are the regular magistrates, and are under the authority of two chief-justices, the "kadiasker" of Europe and of Asia; while over them all stands the grand mufti or "Sheik-ul-Islâm," the spiritual head (under the Caliph) of orthodox Mohammedanism and supreme judge of the Ottoman empire. The verdicts or decisions of the ulema are called "fetvas." The ulema form the ultra-conservative party in all Mohammedan countries; their interpretations of the Koran, when honest, are rigidly and pedantically in accordance with established tradition, but as individuals they are far from incorruptible. To them is due the lifeless formalism that prevails in Mohammedan countries, and they are the prime movers in all outbreaks of fanaticism.

ULFILAS, or **WULFILA**, a Gothic bishop and translator of the Bible; born in one of the Gothic settlements to the N. of the Danube in A. D. 311. He was probably of pure, perhaps noble Gothic blood, the story told by Philostorgius, that his progenitors were among the prisoners brought by the Goths from Cappadocia in 258, resting on very insufficient authority. Being sent to Constantinople on a embassy—possibly as a hostage—he adopted the Christianity of the capital, which was then of the Arian type, and was appointed "Anagnostes"; and it was probably while holding this office, which in the Greek Church involves preaching as well as reading, that he executed the Gothic translation of the Scriptures. Early in the year 341, having just reached the required age, he was consecrated bishop of the Goths by Eusebius of Nicomedia at Antioch, and immediately returned to his people across the Danube. After laboring among them for seven years, he and his converts were obliged by the persecution of the heathen Prince Athanaric to take refuge within the limits of the Roman empire, and for the rest of his life he continued to labor in the country of the Balkans.

Subsequently to the first Gothic immigration and shortly before the battle of Adrianople in 378 he seems to have been employed in fruitless negotiations between the Gothic and Imperial generals; and three years after (in 381) he died in Constantinople, having gone there partly to remonstrate with a lapsed sect of semi-Arians; partly to petition the emperor for a General Council. He translated into Gothic both the Old and the New Testaments, with the exception apparently of four books (I and II Samuel, and I and II Kings); but only a small proportion of his work has been preserved. Mark is the only one of the Gospels that is complete; the Acts of the Apostles, the Epistle to the Hebrews, those of James, Peter, John, and Jude, and the Apocalypse, are altogether lost; and the Old Testament has left only a few fragments. But the fact that they furnish the oldest text of any German tongue, renders even the minor relics of inestimable value to the philologist. The principal MS. is the "Codex Argenteus," written with silver letters on a purple parchment, which was discovered by Arnold Mercator about the end of the

16th century in the Abbey of Werden near Düsseldorf, and after various vicissitudes was enshrined in silver at Upsala in Sweden. Portions of the Epistle to the Romans were found on a palimpsest ("Codex Carolinus") at Wolfenbüttel in 1756, and portions of other Pauline epistles on palimpsests at Bobbio by Mai and Castiglione in 1818. A Gothic paraphrase, probably of the 6th century, based on Ulfilas' version of John's Gospel, was published by Massmann (Munich 1834). The chief editions of Ulfilas are Francis Junius (Dort. 1665, Amst. 1684), Edward Lye (Oxf. 1750), Lahn (Weissenfels 1805), Gabelentz and Löbe (Leip. 1843-1860), Massmann (Stuttg. 1857), Stamm (Paderborn 1858, etc., new ed. by Heyne, 1874), Bernhardt (Halle, 1875).

ULLMANN, KARL, a German theological writer; born in Epfenbach in the Palatinate, March 15, 1796. He was appointed professor in the University of Heidelberg in 1826. Among his works are: "Gregory of Nazianzus" (1825); "Reformers before the Reformation" (1841); "Historical or Mythical?" (1838), a critique of Strauss' "Life of Jesus." He died in Karlsruhe in 1865.

ULLOA, ALFONSO DE, a Spanish historian. His principal works are: "Life of the Emperor Charles V." (1560); "Life of the Emperor Ferdinand" (1565); "History of the Capture of Tripoli in Barbary" (1566); "History of Europe, 1564-1566" (1570). He died about 1580.

ULLOA, ANTONIO DE, a Spanish statesman; born in Seville, Spain, Jan. 12, 1716. He spent many years in North and South America, and was governor of Louisiana in 1766. Among his writings are: "Account of a Voyage to South America" (1748); "American Notes: Physico-Historical Talks on South America and Eastern North America" (1772); "Secret Information concerning America" (1826), confidential reports made to the Spanish ministry. He died near Cadiz, Spain, July 5, 1795.

ULLSWATER, after Windermere the largest of English lakes; between the counties of Cumberland and Westmorland, 5½ miles S. W. of Penrith and 11 E. S. E. of Keswick. Lying 477 feet above sea-level, it is 9 miles long, ¼ to ¾ mile broad, and 205 feet in maximum depth. It is divided into three reaches, which increase in beauty and grandeur as one goes up it from Pooley Bridge to Patterdale, a chief feature of the landscape being the lofty mountain Helvellyn (3,118 feet), which rises from the S. W. extremity of the lake.

ULM, a town of Germany, in Württemberg; at the base of the Suabian Alps, on a declivity, and on the left bank of the Danube. The city is very strongly fortified, of great age, and has many quaint and curious streets and buildings, many of the tall houses forming the narrow irregular streets being constituted of wood, and most elaborately carved. The cathedral is the great object of admiration, being one of the largest and loftiest Gothic ecclesiastical buildings in Germany. The tombs, stained windows, and shrines, oak carvings, and paintings in oil by the early German masters, which adorn the interior, make the cathedral of Ulm in every respect unique. Manufactures are linen, silks, paper, leather, tobacco, porcelain, and playing cards. Pop. about 60,000.

ULMUS, the elm; the typical genus of *Ulmaceæ*. Flowers perfect; calyx persistent, campanulate, or conical at the base, with three to eight divisions; stamens five, filaments straight in æstivation; ovary two-celled; seed-vessel a samara winged all round; known species about 13. Distribution that of the order. Two species, *U. americana*, the common white elm, and *U. fulva*, the slippery elm, are abundant in America. The bark of *U. campestris* is used in India as an alterative, tonic, and demulcent in chronic skin diseases, especially lepra, psoriasis, and herpes; also as a diaphoretic and diuretic. The bark of *U. wallichiana*, a large deciduous tree from the northwestern Himalaya, contains a strong fiber especially derived from the flower stalk. An oil is expressed from *U. integrifolia*, another large deciduous tree, a native of the Indian and Burmese hills; its bruised leaves are applied to boils.

ULNA, a long prismatoidal bone, at the inner side of the forearm, parallel with the radius, with which it articulates. It is the larger and longer of the two bones, and consists of a shaft and two extremities, the upper of which forms a large part of the articulation of the elbow joint. At the upper extremity behind is a large process, the olecranon, and a smaller one, the coronoid process, in front, separated by the sigmoid or semi-lunar fossa, or olecranoid cavity, which receives the articular trochlea of the humerus. The ulna diminishes in size from above downward, and is very small at the lower extremity, which is separated from the wrist by an interarticular fibrocartilage.

ULRICH, CHARLES FREDERICK, an American artist; born in New York City, Oct. 18, 1858; learned his profession at Cooper Institute and the Na-

tional Academy. He then studied in Munich, where he was awarded a medal in 1879. For several years he painted in New York City, but in 1884 removed to Italy; was made an associate of the National Academy in 1883. His most noted works include "In the Land of Promise," "The Glass Blowers," "The Wood Engraver," "The Carpenter," "The Waifs," "A Dutch Typesetter," and "Washing of Feet in Venice." He died in 1908.

ULRICH, EDWARD OSCAR, an American palæontologist; born in Cincinnati, O., Feb. 1, 1857; received a collegiate education; studied medicine; was curator of geology in the Cincinnati Society of Natural History in 1877-1881; palæontologist on the geological surveys of Illinois, Minnesota, and Ohio, in 1885-1896; and became geologist and palæontologist on the United States Geological Survey. His publications include many works on American palæontology.

ULRICI, HERMANN, a German philosopher; born in Pförte, Saxony, March 23, 1806. He published in 1833 his "Characteristics of Ancient Historiography." This was followed by his "History of Poetic Art in Greece" (2 vols. 1835), and a "Treatise on Shakespeare's Dramatic Art" (1839), which was received with great favor. His philosophical works include "On the Principle and Method of Hegel's Philosophy" (1841), and "God and Nature" (1862). He died in Halle, Prussia, Jan. 11, 1884.

ULSTER, a province of Ireland, occupying the northern part of the island and consisting of the counties of Antrim, Armagh, Cavan, Donegal, Down, Fermanagh, Londonderry, Monaghan, and Tyrone. The total area is 8,613 square miles, and the population about 1,580,000. Over half of the inhabitants are Presbyterians and Episcopalians. The largest city is Belfast (*q. v.*). The principal opposition against Irish Home Rule comes from the inhabitants of Ulster. See IRELAND.

ULTIMA THULE (Extremest Thule), a name given in ancient times by the inhabitants of southern Europe to the remote regions of the unknown North. The Greek navigator Pytheas (who probably lived in the latter part of the 4th century B. C.) made a voyage along the coast of Britain and wrote an account of what he learned about the Shetland and Orkney islands and possibly the N. mainland calling the region Thule. The name became vague in its application, especially under the form Ultima Thule. Norway, Iceland, etc., bore the title in turn; and many strange superstitions were current regarding the region.

ULTRAMARINE, a brilliant blue color, in very extensive use by painters, paper stainers, calico printers, and others. The substance previous to the year 1828 was obtained only from lazulite or lapis lazuli, a beautiful and costly mineral substance. The mineral being rare, and much prized for ornamental inlaying, and the color being of unapproachable brilliance and depth, it was an extremely expensive pigment. In consequence, strenuous efforts were made to obtain an equally valuable product by artificial means. In 1824 the French Société d'Encouragement pour l'Industrie Nationale offered a premium of 6,000 francs for the manufacture of an ultramarine blue, possessing all the qualities of that extracted from lapis lazuli, and in 1828 the prize was awarded to M. Guimet of Lyon, who after four years' investigation succeeded perfectly in producing the valuable substance by a synthetical process. The ultramarine thus made was declared by competent judges to be in every way equal to the natural product; and Horace Vernet, who was one of the first to use the material, after employing it in his famous picture, "The Battle of Fontenoy," declared the substance to be even superior to natural ultramarine. M. Guimet's factory has continued since that time to manufacture ultramarine of the highest quality. His process was never made public; but in the same year, 1828, Gmelin, a German chemist, made public a process for manufacturing ultramarine, which was extensively taken up and worked in Germany. These two discoverers may thus be fairly credited with the joint honors of this most brilliant triumph of chemical research.

The composition of artificial ultramarine varies considerably, as does also its color, the latter showing many tones of blue and violet, and there is further a green ultramarine, which is obtained in an intermediate stage of the manufacture. It is prepared by first dissolving silica in caustic soda, to which hydrate of alumina is then added in the proportion of 30 of alumina to 35 of silica. The mixture is dried and mixed with an equal weight of sublimed sulphur and to this again is added a mixture of equal parts of sulphur and sodic carbonate, weighing as much as the silica and alumina mixture. The whole is then submitted for two hours to a red heat in closed crucibles, whereby green ultramarine is produced and this is again heated in crucibles till the desired blue hue is developed. Ultramarine is manufactured extensively in Germany, France, Belgium and the United States.

ULTRAMONTANISM, in Church history, a name improperly given by some theologians, N. of the Alps, before the Vatican Council in 1870, to the generally received opinion of the Church in all ages, that the Papal utterances *ex cathedrâ* on matters of faith or morals are irreformable. The word was used in contradistinction to Gallicanism, which attributed infallibility and supreme authority in matters of faith, morals, and discipline to the entire Church, personified in a General Council. Since the definition of the Vatican Council in 1870 concerning the infallibility of the Pope, Gallicanism has become a heresy.

ULTRA VIOLET, a term applied to the rays beyond the violet, or high, end of the spectrum. The vibrations of these rays are too rapid for vision, but they possess greater chemical activity than any others.

ULUGH BEG, the grandson of Tîmûr, or Tamerlane; governed western Turkestan as regent for his father Shah Rokh, while the latter was employed in regulating the affairs of the S. half of the empire, and succeeded in 1447 to the imperial throne on his father's death. He was a successful warrior, as every ruler of this period had to be, but happened, unfortunately, to conceive suspicions of the loyalty of his eldest son, suspicions founded only on astrological indications. The offended and injured prince rebelled, defeated and captured his father, and soon after caused him to be put to death, thus fulfilling the prediction, 1449. Ulugh Beg is known to posterity as the founder of the observatory at Samarcand, as the liberal patron of astronomers, and as himself a most diligent observer. The astronomical tables which bear his name, in all probability compiled by himself and his fellow laborers, enjoy a high reputation for accuracy. The astronomical works of Ulugh Beg were written in Arabic, afterward translated into Persian, and thence into Latin by Greaves, who followed with a Latin version of the geographical part in 1652.

ULYSSES, in heroic history, one of the most renowned of the Greek heroes. Ulysses was the King of Ithaca, one of the small Ionian isles, the husband of the exemplary Penelope, and father of Telemachus. Ulysses was not only a prudent warrior, but a sage counsellor, and was as much honored in the general conference as he was valued in the field for his military skill, ready expedients, and undaunted courage. When the Greeks undertook the Trojan War, Ulysses, after long declining to join the alliance, at last consented, and, embarking his small but picked band, set sail for the Phrygian shores. During the war he acted a prominent part; he induced Achilles to return to the camp, slaughtered the sleeping Thracians in their tents, entered Troy in disguise, and carried off the palladium of the Trojans. After the fall of the city he embarked on board his fleet, with his followers, to return to his wife and kingdom; but the gods, enraged at his carrying off the palladium, defeated all his efforts to regain his native country, and for 20 years, by adverse winds and fearful storms, made him the sport of winds and waves. At length, after an absence of 30 years, he regained his island home and found his faithful and still beautiful Penelope surrounded by a host of importunate suitors. Having by stratagem obtained an entrance into his palace, and put to the sword the riotous suitors, Ulysses was restored to his throne, to the arms of his wife, and to his son, whom he had left a child. After a reign of 16 years, a natural son of Ulysses, not knowing Ithaca was part of his father's kingdom, landed in the island at the head of a lawless band, and, beginnning to plunder the inhabitants, Ulysses hastened to meet the invader; when, in the contest that ensued, he fell by the sword of his son. It is the adventures encountered by Ulysses on his return voyage that form the subject of Homer's poem of the "Odyssey."

UMA, in Hindu mythology, one of the principal names of the consort of the god Siva. She is also usually designated under the name of Kâli, Durgâ, Devî, Pârvatî, Bhavânî, etc. The myths relating to this goddess, who is worshiped in various parts of India—particularly, however, in Bengal—are met with in the great epic poems and Purânas, in poetical works, such as the "Kumârasambhava," and in modern popular compositions; but the text-book of her worshipers is the "Devimâhâtmya," or "the majesty of Devi"—a celebrated portion of the "Markandeya Purana," considered to be of special holiness by the worshipers of this goddess, and in which are narrated the martial feats of the goddess. The latter consisted chiefly in the destruction by her of two demons, Madhu and Kaitabha, who had endangered the existence of the god Brahman; the demon Mahisha, or Mahishasura, who having conquered all the gods, had expelled them from heaven; moreover, in her defeating the army of Chadna and Munda, two demon servants of Sumbha and Nisumbha. She is often represented holding the severed head of Chanda in her hand, with the heads of his soldiers formed into a garland suspended from her neck, and their

hands wreathed into a covering round her loins—the only covering she has in the image constructed for the pûjâ. The worship of Kali (the Black), to which the narrative (of her victory over Chanda and Munda) has given rise, is considered by the Hindus themselves as embodying the principle of "tamas," or darkness. She is represented as delighting in the slaughter of her foes, though capable of kindlier feeling to her friends. She is, however, styled the Black Goddess of Terror, frequenting cemeteries, and presiding over terrible sprites, fond of bloody sacrifices; and her worship taking place in the darkest night of the month.

UMBALLAH, or **AMBALA**, the chief town of the district and the division of the same name, in Punjab, British India; 120 miles N. N. W. of Delhi. It is a walled town with brick houses, and is an important military station and the railway station for Simla. It was the scene of the great "durbar" of 1869, when Lord Mayo in much state received Shere Ali, the late Ameer of Afghanistan. Pop. about 85,000. The district of Umballah, which lies at the foot of the Himalayas between the Sutlej and Jumna rivers, has an area of 2,621 square miles. The crops are wheat, millets, rice, grain, Indian corn, and barley.

UMBER, a well-known pigment of an olive-brown color in its raw state, but much redder when burnt. It consists of an ocherous earth containing manganese, is durable, has a good body, and is useful in oil and water-color painting. It occurs either naturally in veins or beds, or is prepared artificially from various admixtures. That which is brought from Cyprus, under the name of Turkish umber, is the best. It is of a brown citrine color, semi-opaque, has all the properties of good ocher, is perfectly durable both in water and oil, and one of the best drying colors we possess. It injures no other good pigment with which it may be mixed. Also, a variety of peat or brown coal occurring near Cologne, used as a pigment and for the adulteration of snuff. In mineralogy, a clay-like substance of varying shades of a brown color, consisting essentially of a hydrated silicate of alumina mixed with varying proportions of iron and manganese oxides. Used as a pigment.

UMBILICAL CORD, or **NAVEL STRING**, the bond of communication between the fœtus (which enters at the umbilicus, or naval) and the placenta, which is attached to the inner surface of the maternal womb. It consists of the umbilical vein lying in the center of the two umbilical arteries winding from left to right round the vein. Contrary to the usual course, the veins convey arterial blood to the fœtus, and the arteries return venous blood to the placenta. These vessels are embodied in a yellow gelatinous matter, known from its first describer (in 1659) as Wharton's gelatine. Nervous filaments have been traced into the cord; but the presence of lymphatics is doubtful. The whole is invested by a membrane (the amnion), and its ordinary length is about 20 inches. As soon as a child is born, and its respiration fairly established, the umbilical cord is tied, and divided near the navel, which spontaneously closes, the fragment of cord dying away.

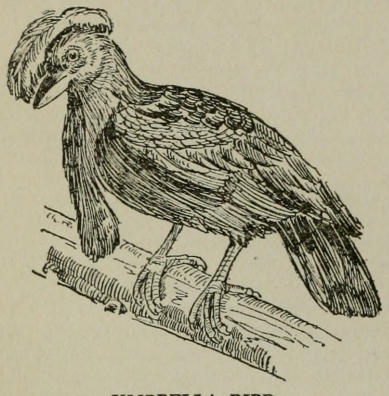
UMBILICAL HERNIA, a hernia which protrudes through the umbilical opening in the middle line at the umbilicus. It is most commonly met with in infants and in women advanced in life, especially in obese subjects.

UMBRELLA, a light frame covered with silk, cotton, alpaca, or other fabric, and held above the head as a protection against sun or rain. The use of the umbrella came to us from the East, where it has been in use from remote times, and where it is considered as a symbol of royalty or dignity. As a defense against rain it was not generally used in the Occident till the middle of the 18th century.

In zoölogy, the bell-shaped swimming organ of the *Lucernaridæ*, akin to the nectocalyx of the *Medusidæ*, but without a velum. In zoölogy and palæontology, Chinese umbrella shell; a genus of *Pleurobranchidæ*, with six recent species, from the Canaries, Mediterranean, India, China, and the Sandwich Islands. Shell small, depressed, and limpet-like, marked by concentric lines of growth; inner surface with a central colored and striated disk, surrounded by a continuous irregular muscular impression. Animal with a very large foot, deeply notched in front, gill forming a series of plumes beneath the shell in front and on the right side. Fossil species four, from the Oölite onward of the United States, Sicily, and Asia.

UMBRELLA BIRD, in ornithology, the *Cephalopterus ornatus*, from Peru. It is about the size of a crow, with deep black plumage; the head is adorned with a large spreading crest, which arises from a contractile skin, and capable of being erected at will; the shafts of the crest-feathers are white, and the plumes glossy blue, hair-like and curved outward at the tips. When the crest is laid back the shafts form a compact white mass, sloping up from the back of the head;

when it is erected the shafts radiate on all sides from the top of the head, reaching in front beyond and below the beak, which is thus completely concealed from view. A long cylindrical plume hangs down from the middle of the neck; the feathers of the plume lap over each other like scales, and are bordered with metallic blue. Umbrella birds associate



UMBRELLA BIRD

in small flocks, and live almost entirely upon fruits. Their cry, which resembles the lowing of a cow, is most frequently heard just before sunrise and after sunset.

UMBRIA, one of the ancient divisions of Italy; lying E. of Etruria, and N. of the country of the Sabines. It is usually described as extending from the Tiber E. to the Adriatic; but when the Umbrians first came into history they were restricted to the ridges of the Apennines, the lowland region bordering on the Adriatic from the Æsis (Esino) to the Rubicon, being held by a race of Gallic invaders, known as the Senones. The Umbrians were subjugated along with the Etruscans, but joined the Samnites in their last gallant struggle against Rome, and were crushed at Sentinum (295 B. C.)

UMLAUT, in philology, a kind of assimilation of sounds; the change of the vowel in one syllable through the influence of one of the vowels, *a*, *i*, *u* in the syllable immediately following. It is a common feature in several of the Teutonic tongues. In German *umlaut* is seen in the frequent change of the vowels *a*, *o*, *u*, to *ä*, *ö*, *ü*. In Anglo-Saxon it was also common. The change caused by *a* is called *a-umlaut*, and so of the other vowels.

UNALASKA, a village in Alaska, on the island of Unalaska, the most W. of the group extending from the extremity of the Alaska peninsula. It contains a church, priest's residence, and stores. Unalaska is the most important settlement in western Alaska, and the commercial center of all the trade in that region. It is the natural outfitting station for vessels passing between the Pacific and Arctic Oceans. In the mountains back of the village is an active volcano. Pop. about 400.

UNCAS, an Indian chief; born in 1600. He was on good terms with the whites, who constanty defended him and the Mohegans, of whom he was chief, against the Pequods and Narragansetts, In 1657 he is said to have presented the ground on which Norwich, Conn., stands to Ensign Leffingwell in return for his services. He died about 1682.

UNCIAL LETTERS, characters of a large, round form, used in some ancient MSS. The earliest form of an alphabet is its capitals, and the oldest Greek and Latin MSS. are written entirely in capitals. Uncial letters, which began to take the place of capital letters in the middle of the 5th century, differ from them in being composed of rounded and not straight lines, and exhibiting a tendency toward greater expedition in style. Uncial writing arose as writing on papyrus or vellum became common, the necessity for more rapid execution leading to the practice of curving the lines. It prevailed from the 6th to the 8th, or even to the 10th century.

UNCLE SAM, the jocular name of the United States Government, used as John Bull is with respect to England. It is an extension of the letters U. S. (United States), printed or stamped on the Government property. It was first used in Troy, N. Y., in 1812, when certain goods purchased for the Government and branded U. S., were officially inspected by Samuel Wilson, whose local nickname was "Uncle Sam." The coincidence of initials suggested the application of the nickname in full to the Government.

UNCONFORMABLE, in geology, the term used when one series of beds is so placed over another that the superior beds repose more or less on the edges instead of on the planes of the inferior series. Thus on the borders of Wales and Shropshire the slaty beds of the Silurian system are curved or vertical, while those of the overlying carboniferous shale and limestone are horizontal. To produce unconformity, three series of events have generally occurred. First, the inferior beds, originally laid down horizontally, must at some subsequent time have been tilted up by a force, probably igneous, from beneath. Secondly, in most cases, the upturned ends

of the strata must have been more or less acted on by denudation, which has rendered them a nearly horizontal plane on which fresh strata can easily rest. Thirdly, these fresh strata have been actually deposited. Approximately to measure the interval of time which these changes have occupied, intermediate beds must be sought for in other districts or regions, or, failing these, note must be taken of the amount of alteration in life which has occurred during the unknown interval. This may be determined by comparing the fossils in the lower with those in the upper beds. Unconformability is of value in fixing the date of ancient seismic or volcanic action. If it tilted up the lower and had no influence on the upper strata, the irresistible inference is that it occurred between the deposition of the two.

UNCONSCIOUS, THE, a theory, originated by Dr. Sigmund Freud, forming the basis of a system employed in the interpretation and treatment of certain mental diseases. This hypothesis of the unconscious, countering to a large extent the former theory of the subconscious, was promulgated in 1893, and is to the effect that the conscious life, varying in its intensity from its clearness at the focus of attention to the marginal states of sounds and sights and other conditions of the senses felt or known in different degrees, has its foundation in the unconscious, which never enters the condition of consciousness, but still, as the stage on which the senses act as a base, directs and conditions the selection of ideas that enter consciousness. The unconscious, according to the new doctrine, is an instinctive force which does not reason in conscious modes. Its indications in the field of consciousness are expressions too formless and elemental for acceptance in social intercourse. As a result there stands at the portal of consciousness an agent or censor whose function is the duty of so transforming the nascent desires or expressions as they raise that they shall not offend the moral sense in the conscious life. The unconscious idea is represented as one which is unable to penetrate consciousness no matter how powerful it may become; and one moreover which we do not perceive but whose existence we concede because of other signs and proofs. An intermediate state such as that out of which mental processes represented by much self-evident systems as are involved in pure mathematics is called the "foreconscious." The impelling influence of the unconscious is said to be illustrated by such lapses as the forgetting of names, which is supposed to be occasioned by latent reluctance to admit them into consciousness owing to unpleasant associations. The influence of the unconscious, however, is shown most powerfully in dreams, and their interpretation according to what is called psychoanalysis is the leading element in Freud's system. The unconscious is considered to be conditioned largely by heredity, fulfilling the blind desire epitomizing the mental evolution of the human family. The primordial psychic desire or libido, ontogenetically developed, seeks satisfaction first in the respiratory, nutritive and eliminative activities of the infant, then in the auto-investigative or auto-erotic stage, then in the development of the ego, and at last in puberty and sexual love in which interest is transferred to the true mate in the opposite sex. Various phases of the unconscious mental life are labeled by Freud as the Narcissistic period, the œdipus complex, and the like, and a fundamental type is supposed to be represented in the frequent attitude of children toward their parents, making the mother the object of affection and regarding the father as a rival. Not only in the individual but in the family and race are the effects of the unconscious seen, and such movements as Freemasonry, alchemy, and the like are described as such manifestations. The doctrine of the unconscious is recognized at present merely as a working formula, to be improved and developed with the march of experience and to be tested by its practical results in psychological treatment.

UNDERWOOD, FRANCIS HENRY, an American author; born in Enfield, Mass., Jan. 12, 1825. He was an active abolitionist; clerk of the Massachusetts Senate in 1852; afterward literary editor of the publishing house of Phillips, Sampson & Co. He assisted in the management of the "Atlantic Monthly" for two years; was elected clerk of the superior court in Boston, which position he held for 11 years. In 1885 he was appointed United States consul at Glasgow; in 1888 the University of Glasgow conferred upon him the degree of LL. D. His works include a "Hand-Book of American Literature" (1872); "Cloud Pictures," a series of imaginative stories musical in theme (1877); "Lord of Himself," a novel of old times in Kentucky (1874); "Man Proposes" (1880); and biographical sketches of Longfellow (1882); Lowell (1882); and Whittier (1883). He died in Edinburgh, Scotland, Aug. 7 1894.

UNDERWOOD, LUCIEN MARCUS, an American botanist; born in New Woodstock, N. Y., Oct. 26, 1853; spent

his youth on a farm, and was graduated at Syracuse University in 1877. He was instructor in several colleges in Illinois in 1879-1883; at Syracuse University in 1883-1891, and at De Pauw University in 1891-1895. He was made Professor of Botany at Columbia University in 1896. He was the author of "Descriptive Catalogue of North America Hepaticæ" (1884); "Moulds, Mildews and Mushrooms" (1899); and "Our Native Ferns and How to Study Them" (1900); etc. He edited the Torrey Botanical Club "Bulletin." He died Nov. 16, 1907.

UNDERWOOD, OSCAR WILDER, a United States Senator from Alabama, born in Louisville, Ky., in 1862. He was educated at the Rugby School and at the University of Virginia, studied law, was admitted to the bar in 1884, and engaged in practice in Birmingham, Ala. Taking an active part in politics, he served in 1894 as chairman of the Democratic district executive committee, was later elected to the 54th Congress, and was successively re-elected up to and including the 63d Congress. During his service in the House of Representatives he made a careful study of financial and economic subjects and became one of the leading authorities on all matters relating to the tariff. He was chairman of the Ways and Means Committee of the 63d Congress. In 1914 he was elected to the Senate for the term ending 1921.

UNDERWRITER, one who writes his name at the foot of a policy of insurance. On some policies, only one such name appears; on others several names are added, when each party thus entering his name, is said to "take a line." The system still prevails abroad, but there are also numerous companies whose business it is to grant marine insurances. The underwriters of American cities do not confine their business to marine insurance, but fire-risks, etc., are now taken.

UNDUE INFLUENCE, in law, a phrase used specially in connection with voting or the making of a will. In the first case it consists of bribery or any force, violence, restraint, threat to inflict injury or intimidation, designed to coerce a person into voting for a particular candidate, or abstaining from voting at all, or as an infliction because of his having done so. The perpetrator exposes himself to a legal penalty. In case of a contested election the principal may be declared, by the court, not elected. In the case of a will, undue influence is exerted when one acquires such an ascendancy over the testator's mind as to prevent the latter from being a free agent. If he spontaneously bequeath money to one whom he esteems or loves, the esteem or affection does not constitute undue influence. Importunity does. When undue influence is proved the will becomes void.

UNEMPLOYMENT, a social problem which had its origin in the institution of the factory system of industry. While the commodities used for general consumption could be manufactured or prepared by hand workers, each possessing his own hand tools, each worker was at least sure of continual employment, whatever the remuneration for his labor might be. With the invention of steam-driven machinery, however, production was so enormously increased that the same amount of commodities could be produced by a much smaller number of workers. This brought about competition among the workers themselves, with the consequence that wages dropped, and though commodities were much cheapened by machinery production, a growing portion of the masses could acquire a much smaller amount of the commodities produced, which again tended to decrease the output of the factories. Working in cycles, it was found that every few years would come a period of overproduction, when the markets would be overstocked, and the factories would be compelled to cease production until the surplus should be consumed. The closing down of the factories, however, would cause unemployment and still further reduce the consuming power of the working classes. These two conditions, working together, would produce those acute periods of unemployment among the industrial classes which have at times threatened the stability of the capitalistic system itself.

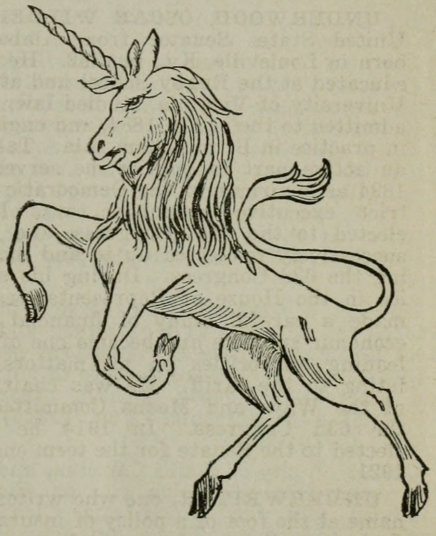
Many remedies have been proposed, the most prominent of which have been social insurance (*q. v.*) and the proposal that governments should initiate large public works when the period of unemployment threatened. One of the worst periods of this kind experienced in this country was during 1893-1894, and again, to a lesser degree, in 1914. In the winter of 1920-1921 another period of unemployment appeared; this, however, was not caused by overproduction, but by the readjustment of the prices of commodities, manufactures in general hesitating to produce on a falling market.

UNGULATA, in zoölogy, a provisional group of mammals, the living members of which correspond to the *Pecora* and *Belluæ* of Linnæus, and the *Ruminantia* and *Pachydermata* of Cuvier. The dentition is heterodont and diphyodont, the milk-teeth not being completely changed

till the animal attains its full development; the molars have broad crowns with tuberculated or ridged surfaces; clavicals absent; toes with broad, blunt nails, or, in most cases, with hoofs, more or less inclosing the ungual phalanges; scaphoid and lunar bones of carpus distinct. The group is usually divided into two minor groups: *U. vera*, often called simply ungulata and subungulata. All the species are eminently adopted for a terrestrial life, and, generally speaking, for a vegetable diet. Some are, to a greater or less extent, omnivorous, as *Sus;* but no genus is distinctly predaceous. Also, true ungulates; a group of mammals classed as an order, or as a group of the wider *U.* Feet never plantigrade, functional toes never more than four, the first digit being suppressed; allantois largely developed: placenta non-deciduate; uterus bicornuate; mammæ usually few and inguinal (as in *Equus*), or many and abdominal (as in *Sus*), but never wholly pectoral. There are two divisions: antiodactyla and perissodactyla, first indicated by Cuvier and established by Owen, who proposed the names now in general use. In palæontology, the Ungulata appear first in the Eocene Tertiary, in which period the *Artiodactyla* and *Perissodactyla* were already differentiated.

UNGVÁR, a town of Hungary, on the Ungh river; 325 miles N. E. of Budapest. It is the residence of a Uniat bishop, and contains a cathedral, convent, seminary, normal school, and Catholic gymnasium. The people are engaged in the culture of the vine, and in the manufacture of pottery ware. Pop. about 17,500.

UNICORN, an animal having a single horn, frequently mentioned by Greek and Latin authors. Ctesias calls it the wild ass, and Aristotle the Indian ass. Ctesias describes the wild ass as being about the size of a horse, with a white body, red head, and blue eyes, having a horn on the forehead a cubit long, which for the extent of two palms from the forehead is entirely white, black in the middle, and pointed and red at the extremity. Of the horn drinking cups were formed, and those who used them were said not to be subject to spasm, epilepsy, or the effects of poison. Unicorns were said to be very swift and strong, not naturally fierce, but when provoked they fought desperately with horn, heels, and teeth, so that it was impossible to take them alive. Browne enumerates five kinds of unicorns: "The Indian ox, the Indian ass, the rhinoceros, the oryx, and that which was more eminently termed monoceros or unicornis"; and in the same chapter he quotes descriptions of this mythical animal from various authors. Wilkin, in a note to Browne, gives a statement from Rüppell that the unicorn exists in Kordofan, where it is known by the name of *millekma*. He describes it as of a reddish color, of the size of a small horse, of the slender make of a gazelle, and furnished with a long, straight, slender horn in the male, which is wanting in the female. Some added that it had divided hoofs, while others declared it to be single-hoofed. Three Arabs told Rüppell that they had seen the animal in



UNICORN AS USED IN HERALDRY

question. All these stories have probably some foundation in fact, to which a large superstruction of fiction has been added. An antelope like an oryx, seen in profile, would appear to a careless observer like an animal with a single horn; and hence the mythical tales of unicorns probably arose.

In heraldry, a fabulous animal, having the head, neck, and body of a horse, with a beard like that of a goat, the legs of a buck, the tail of a lion, and a long tapering horn, spirally twisted, in the middle of the forehead. Two unicorns were borne as supporters of the Scotch royal arms for about a century before the union of the crowns in 1603; and the sinister supporter of the arms of the United Kingdom is a unicorn argent, armed, crined, and unguled or, gorged with a coronet of crosses patée and fleurs-de-lis, with a chain affixed passing between the forelegs and reflected over the back of the last.

Sea unicorn, the narwhal, *Monodon monoceros.*

UNIFORMITY, ACT OF, in English Church history, the Act 13 & 14 Car. II., c. 4, designed to regulate the terms of membership in the Church of England and in the colleges of Oxford and Cambridge. Both the Anglican and the Puritan parties had desired their faith to be that of the Church of England, and Charles II., who, as a step to obtaining his father's throne, wished to stand well with both parties, promised at Breda to use his influence to bring about a certain measure of comprehension. But the Parliament was in no mood to vote for such a scheme, and the Act of Uniformity required the clergy to sign the Thirty-nine Articles and to use the Book of Common Prayer. The enforcement of these regulations led to the secession from the Church of England of upward of 2,000 clergymen, and laid the foundation of modern dissent. The Act of Uniformity Amendment Act, passed July 18, 1872, somewhat modified that of Charles, as the University Test Act, passed June, 1871, had done the year before.

UNION, a town of New Jersey, in Hudson co., adjacent to Weehawken and West Hoboken. There are important establishments for the manufacture of silk and embroidered goods, besides other industrial establishments. Pop. (1910) 21,023; (1920) 20,651.

UNION, a city of South Carolina, and the county-seat of Union co., on the Southern and the Union and Glenn Springs railroads. There are several large cotton, knitting and oil mills. The city is a commercial center of a prosperous agricultural region, cotton, fruit and other farm products being raised. There is a Carnegie library, high school, Federal building and county court house. Pop. (1910) 5,623; (1920) 6,141.

UNION COLLEGE, a coeducational non-sectarian institution in College View, Neb.; founded in 1891; reported at the close of 1919: Professors and instructors, 27; students, 473; president, H. A. Morrison, A. M.

UNION COLLEGE, an American institution of learning established in Schenectady, N. Y., in 1795 by several religious denominations, from which fact it derives its name. It was the first non-sectarian college incorporated in the United States. The movement for the founding of such an institution was inaugurated in 1779, when 500 citizens of eastern and northern New York petitioned the Legislature in its behalf. This request was refused, but an academy was started in Schenectady in 1785, which on Feb. 25, 1795, became Union College. The first president was the Rev. John Blair Smith. In 1804 the Rev. Eliphalet Nott was elected president and held the office till 1866, the longest term of service of any college president in the history of the United States. During his incumbency Union College became one of the best known educational institutions in the country. The Dudley Observatory, the Albany Law School and the Albany Medical College became parts of it in 1873. There are also separate departments in civil engineering and pharmacy. The reports for 1919 showed: Professors and instructors, 42; students, 466; president, C. A. Richmond, LL. D.

UNION LEAGUE CLUB, a club organized in 1863 by members of the Republican party in New York, for social and political purposes. Its object, originally, was "to promote, encourage and sustain by all proper means, absolute and unqualified loyalty to the government of the United States." To-day it is the stronghold of Republicanism, exerting its influence wholly along party lines. The New York Club house is situated at Fifth Avenue and Thirty-ninth Street. The building was designed by Peabody and Stearns, of Boston, and built in 1881. It contains a fine collection of paintings and a library of about 13,000 volumes. Its membership, on Oct. 1, 1918, was 1,800. In Philadelphia, Chicago and other cities there are institutions of the same name which are similarly units in the Republican party machine.

UNION OF SOUTH AFRICA. See SOUTH AFRICA, UNION OF.

UNION THEOLOGICAL SEMINARY, of New York City, was founded in 1836. It was of Presbyterian origin, but is now independent of ecclesiastical control. In 1919 there were 275 students and 33 professors. The Seminary is organically connected with Columbia University, its students being permitted to take courses in the University, and the University students being admitted to certain courses in the Seminary. In 1910 the Seminary moved into new, extensive and attractive buildings at Broadway and 120th Street.

UNIONTOWN, a borough in Pennsylvania and county-seat of Fayette co., on the Baltimore and Ohio and Pennsylvania railroads, 40 miles S. E. of Pittsburgh. It lies in the agricultural and iron-mining region, and has natural gas, electric lights and railway, waterworks, National and State banks, daily and weekly newspapers, public schools, churches and numerous steel and structural iron works. Pop. (1910) 13,344; (1920) 15,692.

UNIT, in arithmetic, the least whole number or one, represented by the figure 1. Numbers are collections of things of the same kind, each of which is a unit of the collection. Thus 20 feet is a collection of 20 equal spaces, each of which is equal to 1 foot; here 1 foot is the unit or base of the collection. In mathematics or physics, any known determinate quantity by the constant repetition of which any other quantity of the same kind is measured. It may be a length, a surface, a solid, a weight, a time, as the case may be. Abstract unit, the unit of numeration; the abstract unit 1 is the measure of the relation of equality of two numbers. It is the base of the system of natural numbers, and incidentally the base of all quantities. Decimal and duodecimal units, those in scales of numbers increasing or decreasing by 10 or 12 respectively. Dynamic units: Unit of force, a dyne; a force which, acting for one second on a mass of one gramme, gives to it a velocity of one centimeter per second. Unit of work done, a watt; the power developed when 44.25 foot pounds are done per minute=one 746th part of a horse-power. Fractional unit, the unit of a fraction. Thus in the fraction ¾ there is an assemblage of three units, each of which is one-fourth of the whole number. Integral unit, the unit 1; the unit of integral numbers. Specific gravity unit, for solids or liquids, one cubic foot of distilled water at 62° F.=1; of air and gases, one cubic foot of atmospheric air at 62°. Unit of illumination, the light of a sperm candle burning 120 grains per hour. The standard for gas is that the flame, burning at the rate of five cubic feet per hour, shall give a light equal to the light of 14 sperm candles, each consuming at the rate of 120 grains per hour. Unit of measure, the unit of measure of any quantity is a quantity of the same kind, with which the quantity is compared. Unit of value, in England, a pound sterling, represented by a gold coin called a sovereign. In the United States, a gold dollar, weighing 25.8 grains, one-tenth of which is alloy.

UNITARIAN CHURCH, a communion comprising all who maintain that God exists in one Person only. The name Unitarian is applied specially to a small Christian sect whose distinguishing tenet is the Unity as opposed to the Trinity of the Godhead. In the more general sense the name of course includes the Jews and the Mohammedans. From the middle of the 2d century to the end of the 3d century there was a succession of eminent Christian teachers—Monarchians—who maintained, against the ecclesiastical doctrine of the Logos, the undivided unity of God. There are said to have been two classes of them—those who taught that Christ was God in such a sense that it was the Father who became man and those who held that Christ was in nature a mere man, but exalted above all other prophets by the superior measure of Divine wisdom with which he was endowed. The latter class was represented by Theodotus, Artemon and especially Paul of Samosata. The grand theological struggle which followed in the 4th century between the Arians and the Athanasians may be regarded as but another phase of the Unitarian controversy.

In England, as early as 1548, a priest named John Ashton was accused of Arianism, and escaped with his life only by recantation; and during the reigns of Edward VI., Mary, Elizabeth and James I. a few suffered martyrdom on similar charges. In the reign of James I. continental Socinianism began to exercise considerable influence in England, and in 1665 Dr. Owen wrote that "the evil is at the door, that there is not a city, a town, scarce a village in England, wherein some of this poison is not poured forth." But it was in the last decade of the 17th century that the controversy on this subject was most active, and at this time were published the anonymous "Unitarian tracts." Hitherto the Unitarians, with the exception of the society formed in London by John Biddle, which did not survive its founder, had no organized existence. The first to use the term Unitarians (1687) was the heretical mercer and philanthropist, Thomas Firmin (1632-1697), a friend of Biddle's. The first preacher who described himself as a Unitarian (1704) was apparently Thomas Emlyn (1663-1741), a Presbyterian who was imprisoned and fined on the charge of blasphemy. After the passing of the Toleration Act in 1689 the way was prepared for that gradual change by which the orthodoxy of the English Presbyterian passed into Unitarianism. It was at this time that most of the old Presbyterian chapels were founded; and the trusts being "open," ministers and people were left free to adopt whatever new opinions should approve themselves to their conscience. Thus the Unitarians may be said to be the successors of the 2,000 Presbyterian divines who in 1662 left the Church of England in consequence of their inability to comply conscientiously with the terms of the Act of Uniformity. The English Presbyterians were originally as orthodox as their Episcopal brethren; but having refused

to commit themselves to any authoritative creed, they underwent a gradual change to Arian, and at length to Unitarian, views. Many preached such views without exciting attention or controversy, though, till 1813, the law which made it blasphemy to speak against the Trinity was still in existence. During the latter half of the 18th century Dr. Priestly appeared as the champion of the humanitarian view of Christ's nature, and by the influence of his writings secured the more open advocacy of that doctrine.

Toward the close of the 18th century there was a certain amount of Arianism among the Moderates in the Church of Scotland. Unitarianism, as a distinct system, was preached at Montrose as early as 1783, and at the beginning of the 19th century some attempts were made to diffuse it by means of missionary efforts. There are now nine congregations in Scotland. That at Edinburgh was originally a branch from the Cameronians, but, having adopted the principle of free inquiry, its members gradually embraced Arian, and eventually (1812) humanitarian, views.

In Ireland the history of Unitarianism is intimately connected with that of Presbyterianism. It flourishes principally in the N. of the island, and the 10,000 Irish Unitarians are Presbyterians in fact as well as in name.

After 1740 Arian views of the person of Christ were pretty widely diffused among the New England clergy; and in 1787 took place the first secession from the Episcopal Church. By imperceptible degrees many of the New England churches glided into Unitarianism; but it was not till about 1815 that the name began to be much used. At that time the influence of Dr. Channing was thrown into the scale; and since then Massachusetts, and particularly Boston, has been the stronghold of Unitarianism in the United States. Harvard University is not a denominational institution; but it is at present in the hands of the Unitarians; and most of their ministers are educated either there or at the Meadville Theological School, Pa. Besides the Unitarians, properly so called, the Universalists and the Hicksite Quakers are understood to hold anti-Trinitarian sentiments, though they give no special prominence to the doctrine of Divine Unity. In polity the Unitarians are congregational, each church being independent in the control of its own affairs. There are National, State and local conferences. The National conference, which meets biennially, declares in its constitution "its allegiance to the gospel of Jesus Christ," and its "desire to secure the largest unity of spirit and the widest practical co-operation" in Christian civilization. The Unitarian Church has its largest representation in Massachusetts, that State containing about one-half of its membership. In 1900 the reports of the denomination showed ministers, 550; churches, 459; and members, 71,000.

There are a few Unitarian churches in the principal colonies of Great Britain; and Unitarian sentiments, under the names of Liberal Christianity and Rationalism, are more or less widely diffused in France, Switzerland, Germany and Holland.

It will of course be understood that the Unitarians of all shades of opinion are agreed in rejecting the entire orthodox scheme—including the doctrines of the Trinity, the vicarious atonement, the deity of Christ, original sin, and everlasting punishment—as both unscriptural and irrational. They celebrate the Lord's Supper in their churches, not as a sacrament, but as a service commemorative of Christ's death, and expressive of spiritual communion with Him. They also adhere generally to the rite of infant baptism, though there are a few Unitarian Baptist churches. Many object to the name Unitarian as one which might be held to imply a doctrinal bond of union, and to be, to that extent, inconsistent with unrestricted freedom of religious thought. When, at the meeting of the British and Foreign Unitarian Association in 1866, it was proposed to add to the rules a clause defining "Unitarian Christianity," the motion was almost unanimously rejected.

UNITED BRETHREN IN CHRIST, THE, a religious denomination which was formed among the Germans of Pennsylvania, largely under the direction of Philip William Otterbein, a pastor of the German Reformed Church, and Martin Boehm, a preacher among the Mennonites. The first important meeting was at Baltimore in 1789, annual conferences beginning to be held in 1800, the first at Frederick, Md. It was on this occasion that the designation of this church was adopted, and Otterbein and Boehm were elected bishops. There was a General Conference in 1815, when a Confession of Faith and a Discipline were adopted. The organization calls for quarterly and annual conferences, and a quadrennial general conference, which is the legislative part of the organization, and since 1901 has been constituted by an equal number of ministers and laymen. All the ordained preachers are elders, and they are the only order recog-

nized. Baptism and the Lord's Supper are the two sacraments accepted. The Confession of Faith adopted in 1889 provided for lay delegates to the General Conference. At the General Conference in that year there was a secession of delegates, which adhered to the older unrevised Confession of Faith and Constitution. The larger church has about 390,000 members with 500,000 pupils in the Sunday Schools, with a theological seminary at Dayton, Ohio, 10 colleges and several academies.

UNITED EVANGELICAL CHURCH, THE, a religious denomination established in 1894 as the result of a secession in the Evangelical Association. The first general conference was held at Naperville, Ill., in that year, and was made up of delegates from six annual conferences. Laws were made to complete the organization of an independent church, a book of discipline was adopted, founded on the old discipline of the Evangelical Association, with the introduction of some changes such as lay representation at the conferences. The church has about 990 organized congregations, 550 preachers, 90,000 church members, and about 94,000 pupils in the Sunday schools. Its General Missionary Society has three missions in Honon, China; and receives the co-operation of the Woman's Missionary Society. It raised about $100,000 for missionary work each year. It has a number of educational establishments, among them Albright College, Myerstown, Pa.; Dallas College and La Creole Academy, Dallas, Ore.; and Western Union College, Le Mars, Iowa. It also publishes some evangelical journals.

UNITED EVANGELICAL CHURCH, THE (IN GERMANY), a church founded in Germany in 1817 by the alliance of parts of the Lutheran and Reformed Churches. A union of the kind had been attempted in 1529, 1631 and 1661. Frederick I. of Prussia (1703-1722) also endeavored to establish a union, and Frederick William I. issued a number of decrees having the same purpose in view. The evolution of theological thought made the union appear desirable during the eighteenth century, and one proposal was that of a unity of exterior organization, leaving doubtful theological points in abeyance. Finally, in 1817, at the tercentennial celebrations of the Reformation, an outward union was established, under the auspices of the government of Prussia. In other parts of Germany parallel unions have been established, the visible evidences being a single governing body and a common celebration of the Lord's Supper. In Prussia the United Evangelical Church was, previous to November, 1918, the state church, and it is stronger there than in other parts of Germany. A United Evangelical Church was established in the United States at St. Louis in 1840.

UNITED IRISHMEN, a secret society, formed in 1791 by Theobald Wolfe Tone, having for its object the establishment of a republic in Ireland. Being arrested, and sentenced to death by a military commission, he committed suicide in November, 1798.

UNITED KINGDOM. See GREAT BRITAIN: BRITISH EMPIRE, THE.

UNITED PRESBYTERIAN CHURCH, a religious body in Scotland, constituted in 1847 by the amalgamation of the "Secession" and "Relief" churches.

At first composed of only four ministers, the "Secession Church" rapidly began to gather strength. Little Christian societies were everywhere formed, which were gradually supplied with pastors either from the Establishment or from youths trained to the work of the ministry by Erskine and his friends. The "four brethren" drew up a testimony declaring their reasons for separation. What they sought was the vindication of what they held to be evangelical truth, much more than of the mere right of popular election. So much popular indignation was excited by their deposition that it was thought desirable by the majority of the Moderate party to make certain concessions to the Evangelicals, or Marrow party. The General Assembly of 1734 passed some measures distinctly favorable to the latter party, and empowered the synod of Perth and Stirling to remove the censures from the four brethren, and to restore them to their respective charges; but Erskine declined to be "reponed." In December, 1736, appeared the pamphlet commonly known as the "Judicial Testimony," which is a sort of survey of the whole ecclesiastical history of Scotland from the Reformation downward. In 1737 four other ministers joined the original four. In 1738 the commission of Assembly libeled the "eight brethren," and summoned them to appear before the Assembly of 1739, which they did; and after a year of grace the General Assembly of 1740 solemnly pronounced deposition, and the connection between Erskine and the church of his fathers was forever at an end.

The career of the United Presbyterian Church as a corporate body has been one of uninterrupted prosperity. In point of doctrine it adheres (like all the other

Presbyterian churches of Scotland) to the Westminster Confession of Faith, and the Larger and Shorter Catechisms. But in 1879 a Declaration Act was adopted, setting forth more clearly and fully the view which the Synod takes of the teaching of Holy Scripture in reference to redemption, the divine decrees, man's depravity, salvation, the civil magistrate, the maintenance of the church, and liberty of opinion. Its form of church government is Presbyterian; but, unlike the Established and Free Churches, it has no intermediate courts between presbyteries and the supreme court, the Synod, really an assembly of the whole clergy, with one elder from each kirk-session. It has a Theological Hall and Library in Edinburgh, and a staff of professors. Though inferior in point of wealth to the Established and Free Churches, the United Presbyterian Church has honorably distinguished itself by its general liberality and occasional munificence. Negotiations for union between the United Presbyterian and Free Churches failed in 1863-1873, but were reopened in 1897. In the year 1875 about 100 congregations of the United Presbyterian Church situated in England were transferred to the "Presbyterian Church of England." But the mother church in Scotland counted in 1897 about 580 congregations and 192,000 members.

In 1919 the United Presbyterian Church in the United States reported 991 churches, 995 ministers, and 160,726 communicants.

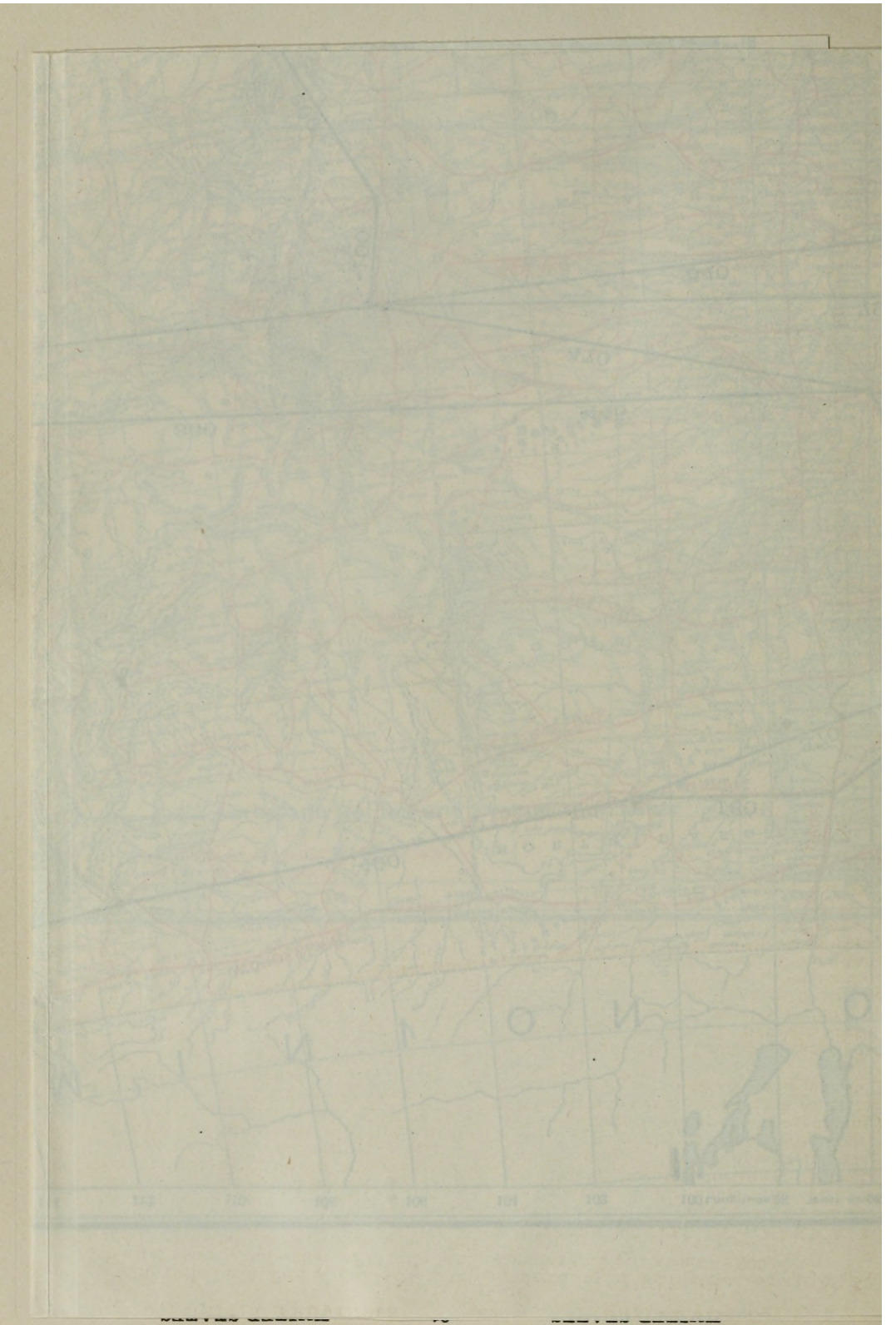
UNITED PROVINCES OF AGRA AND OUDH, formerly known as the Northwestern Provinces and Oudh. A province of British India in the valley of the upper Ganges river. It has an area of 107,267 square miles, of which 83,109 belong to the territory of Agra, and 24,158 to the territory of Oudh. The province, for the most part, consists of a low plain, well watered by the Ganges river. There is, however, in the extreme southern part, the mountain region of the Himalaya. The climate is hot and unhealthful. The chief industries are the growing of wheat, which in recent years has been increased by extensive irrigation works. Over 50,000,000 acres are under cultivation. Rice is also grown in large quantities, as are other agricultural products. Sugar cane is an important agricultural product. Other crops include maize, cotton, opium, and indigo. There are cotton mills in Cawnpore and other cities. The province is better supplied with railroads than any other in India. They are under the administration of a lieutenant-governor, who is assisted by a legislative council of 50 members. Pop., about 48,000,000.

UNITED STATES OF AMERICA, a Federal republic, composed of 48 States, the District of Columbia, the District of Alaska, the territories of Hawaii and Porto Rico, the Philippine Islands, Guam, Tutuila, the Panama Canal Zone, and the Virgin Islands; chiefly occupying the temperate portions of North America from lat. 24° 20′ to 49° N., and lon. 66° 48′ to 124° 32′ W.

Boundary.—The United States is bounded on the N. by British North America, the boundary line running through the Strait of Juan de Fuca to the S. of Vancouver's Island, but to the N. of the island of San Juan, striking the mainland at the 49th parallel and running along that parallel to the Lake of the Woods, and thence by a devious route through the Great Lakes and along the Laurentian water-shed to the St. John's and St. Croix rivers and Fundy Bay. The land boundary is a clearing 30 feet wide, with iron mile posts 4 feet high painted white. The E. and W. boundaries are formed by the Atlantic and Pacific Oceans respectively, the S. boundary by the Gulf of Mexico, the Rio Grande del Norte up to the 32d parallel, and a broken line drawn between the 31st and 33d parallels to the Pacific separating the United States from Mexico. These boundaries do not include Alaska. The ocean shore lines are as follows: North Atlantic coast, including bays, islands, etc., 6,150 miles; South Atlantic coast, 6,209; Mexican Gulf coast, 5,744; Pacific coast, 3,251—total, 21,354. The land, lake, and river boundary toward Canada is 3,700 miles, and the similar one toward Mexico, 2,105 miles; making the total ocean, land, lake, and river boundary, 11,075 miles. Excluding Alaska the greatest Continental extent E. and W. is 3,100 miles and N. and S., 1,780 miles.

Area.—The tables shown on pages 81 and 82 give the area of the continental territory by States and Territories.

Topography.—The two great mountain systems of the United States are the Appalachians and the Rocky Mountains. The former extend from the mouth of the St. Lawrence to the mouth of the Mississippi—a distance of 1,300 miles—and at the S. bend inland, leaving the wide and rich seaboard of Virginia, the Carolinas, Georgia, Alabama, and Florida. This maritime region includes all the older States, and its inhabitants still amount to one-third of the whole. As far S. as the Hudson river it is hilly; thence, as far as the Alleghenies extend, its surface is divided between a plain and a mountain slope, the base of which appears to have




DOMINION OF CANADA
UNITED STATES
MEXICO
Aeroplane Routes and Distances in Miles
Automobile Highways
PACIFIC OCEAN
ATLANTIC OCEAN
GULF OF MEXICO

State or Territory		Date of Act of Organization or Admission	Total Area (Sq. Miles)
Original States:			
New Hampshire		.....	9,341
Massachusetts		.....	8,266
Rhode Island		.....	1,248
Connecticut		.....	4,965
New York		.....	49,204
New Jersey		.....	8,224
Pennsylvania		.....	45,126
Delaware		.....	2,370
Maryland		.....	12,327
Virginia		.....	42,627
North Carolina		.....	52,426
South Carolina		.....	30,989
Georgia		.....	59,265
States Without Previous Territorial Organization Admitted:			
Vermont		Mar. 4, 1791	9,564
Kentucky		June 1, 1792	40,598
Tennessee		June 1, 1796	42,022
Maine		Mar. 15, 1820	33,040
Texas		Dec. 29, 1845	265,896
West Virginia		June 19, 1863	24,170
States With Previous Territorial Organization Admitted:			
Ohio	Territory	May 7, 1800	.....
	State	Feb. 19, 1803	41,040
Louisiana	Territory	Mar. 3, 1805	.....
	State	**Apr. 30, 1812**	48,506
Indiana	Territory	May 7, 1800	.....
	State	Dec. 11, 1816	36,354
Mississippi	Territory	Apr. 7, 1798	.....
	State	Dec. 10, 1817	46,865
Illinois	Territory	Feb. 3, 1809	.....
	State	Dec. 3, 1818	56,665
Alabama	Territory	Mar. 3, 1817	.....
	State	Dec. 14, 1819	51,998
Missouri	Territory	June 4, 1812	.....
	State	Aug. 10, 1821	69,420
Arkansas	Territory	Mar. 2, 1819	.....
	State	June 15, 1836	53,335
Michigan	Territory	Jan. 11, 1805	.....
	State	Jan. 26, 1837	57,980
Florida	Territory	Mar. 30, 1822	.....
	State	Mar. 3, 1845	58,666
Iowa	Territory	June 12, 1838	.....
	State	Dec. 28, 1846	56,147
Wisconsin	Territory	Apr. 20, 1836	.....
	State	May 29, 1848	56,066
California	Territory	Mar. 1. 1847	.....
	State	Sept. 9, 1850	158,297
Minnesota	Territory	Mar. 3, 1849	.....
	State	May 11, 1858	84,682
Oregon	Territory	Aug. 14, 1848	.....
	State	Feb. 14, 1859	96,699
Kansas	Territory	May 30, 1854	.....
	State	Jan. 29, 1861	82,158
Nevada	Territory	Mar. 2, 1861	.....
	State	Oct. 31, 1864	110,690
Nebraska	Territory	May 30, 1854	.....
	State	Mar. 1, 1867	77,520
Colorado	Territory	Feb. 28, 1861	.....
	State	Aug. 1, 1876	103,948
North Dakota	Territory	Mar. 2, 1861	.....
	State	Nov. 2, 1889	70,837
South Dakota	Territory	Mar. 2, 1861	.....
	State	Nov. 2, 1889	77,615
Montana	Territory	May 26, 1864	.....
	State	Nov. 8, 1889	146,997
Washington	Territory	Mar. 2, 1853	.....
	State	Nov. 11, 1889	69,127
Idaho	Territory	Mar. 3, 1863	.....
	State	July 3, 1890	83,888
Wyoming	Territory	July 25, 1868	.....
	State	July 10, 1890	97,914
Utah	Territory	Sept. 9, 1850	.....
	State	Jan. 4, 1896	84,990
Oklahoma	Territory	May 2, 1890	.....
	State	Nov. 16, 1907	70,057
New Mexico	Territory	Sept. 9, 1850	.....
	State	Jan. 6, 1912	122,634
Arizona	Territory	Feb. 4, 1863	.....
	State	Feb. 14, 1912	113,956

Authorities differ somewhat on some of these dates and areas: the above are from Census reports.

State or Territory		Date of Act of Organization or Admission	Total Area (Sq. Miles)
Territories, etc.:			
District of Columbia	Territory	July 16, 1790	.....
	District	Mar. 3, 1791	70
Alaska	District	July 27, 1868	590,884
Hawaii	Territory	June 14, 1900	6,449
Total exclusive of Alaska and Hawaii		.....	3,026,789
Total including Alaska and Hawaii		.....	3,624,122

NONCONTIGUOUS TERRITORY OF THE UNITED STATES: DATES OF ACQUISITION AND ORGANIZATION, AND POPULATION AND AREA

Territory		Date of Acquisition or Organization	Area (Sq. Miles)	Population	
				Year	Number
Alaska (District)	Acquired	June 20, 1867	590,884	1919	65,062
	Organized	July 27, 1868			
Guam	Acquired	Apr. 11, 1899	210	1919	14,969
Hawaii	Acquired	July 7, 1898	6,449	1919	226,938
	Organized	June 14, 1900			
Panama Canal Zone	Acquired	Feb. 26, 1904	527	1918	21,707
Philippine Islands	Acquired	Apr. 11, 1899	115,026	1919	9,101,427
Porto Rico	Acquired	Apr. 11, 1899	3,435	1919	1,262,158
Tutuila Group	Acquired	Mar. 8, 1900	77	1916	7,550
Virgin Islands	Acquired	Mar. 31, 1917	132	1917	26,051

been the shore of an ancient sea. The most fertile part of this slope is between Long Island and the Potomac. The coast to the Mississippi is sandy throughout; from Long Island to North Carolina it is marshy only close to the sea, but farther S. the seaward half of the plain is covered with swamps. The Appalachians form the watershed between the rivers draining into the Atlantic and the tributaries to the Mississippi, though some of the former may be said to rise on the inland side of the mountains, and to force a passage through them to the sea. The principal rivers falling into the Atlantic are the Penobscot, Kennebec, Merrimac, Connecticut, Hudson, Delaware, Susquehanna, Potomac, Rappahannock, James, Roanoke, Pedee, Santee, Savannah, and Altamaha. The Chattahoochee and the Flint river joining form the Appalachicola; the Alabama and Tombigbee, the Mobile; these drain into the Gulf of Mexico E. of the Mississippi.

The great central plains and prairies between the Appalachians and the Rocky Mountains are drained almost entirely by the Mississippi and its affluents, chief of which are the Ohio, Tennessee, Missouri, Arkansas, and Red river. The only other river of great importance flowing into the Gulf of Mexico is the great boundary river, the Rio Grande del Norte. The streams flowing N. are trifling, the principal being the Red river of the North, which flows into Lake Winnipeg. Almost the whole of the Mississippi basin consists of open, rolling prairies, while, on the other hand, almost all the country between the Appalachians and the Atlantic was originally more or less thickly wooded. Between the Rocky Mountains and the Pacific Alps, called Sierra Nevada, in California and Cascade Range farther N., lies a rainless region, mostly S. of lat. 45° N., with an average elevation of 5,000 feet above the ocean, great part of it communicating, not with the sea, but draining into salt lakes and marshes. Except where irrigated, this plateau is utterly unproductive. To the N. it is drained by the Columbia, with its tributary the Snake river, which forces its way through the Sierras to the Pacific; while in the S. portion the Colorado and its affluents, after flowing through frightful cañons 3,000 to 5,000 feet below the surface of the plateau for some 600 miles, forms a delta at the head of the Gulf of California. The Great Cañon of the Colorado is more than 300 miles long. Between the Sierras and the ocean stretches the comparatively narrow but rich and beautiful sea-coast known as the Pacific Slope, drained by the Columbia, the Klamath, the Sacramento, and the San Joaquin, along with numerous smaller streams. The "Great Divide," or watershed, is in Montana and Wyoming, whence flow the Missouri, Columbia, and Colorado. In this wild region Congress set apart in February, 1872, the Yellowstone National Park, a tract 62 by 54 miles in extent (3,312 sq. miles) in the N. W. of Wyoming. The region, while mostly unfit for agriculture and mining, contains more natural marvels than can be found elsewhere. There

are hot springs with their basins incrusted with calcareous spar, steam jets, geysers, mud volcanoes, waterfalls, caves with stalactites and stalagmites, eroded columns, statues, castles, cathedrals, etc., and a large lake swarming with fish. The valley of the Upper Yellowstone abounds in these wonders. Further details of the topography of the country will be found in the articles on the several States and Territories.

Climate.—The vast area of the United States necessarily exhibits a great variety of climate. New York has the summer of Copenhagen and the winter of Rome, the minimum range of the mercury being 5° in winter, and the maximum 98° in summer. The States bordering on Canada exceed both of these extremes, but throughout the Middle States, lat. 37°-41°, the climate is agreeable and often delightful throughout most of the year. The main peculiarity of the North American seasons is the almost total absence of spring. Mason and Dixon's Line, with its W. extension along the Ohio, Mississippi, and Missouri, has a historical interest, but is also of climatic importance in the geography of the cis-Missouri States. N. of it, sleighs are in frequent use during winter; S. of it, they are seen rarely. To the N. the productions are those of the temperate zone, and the States were always free; to the S., the country becomes more and more tropical as one advances. From meridians 98° to 100° the climate is still variable from year to year, seasons of rain and plenty being followed by others in which drought is the forerunner of scarcity. But the planting of forest trees and the cultivation of the soil, at first by irrigation, has largely increased the amount of rainfall. Along the Pacific seaboard, especially in California, the climate resembles that of S. Europe. The isothermal lines, roughly stated, show a mean temperature of 72° for Florida, the Gulf Shores, and Arizona; of from 52° to 60° for S. of Pennsylvania, Virginia, the N. border of the Carolinas, Tennessee, Missouri, Kansas, S. of Utah and Nevada, and the greater part of California; from 44° to 52° for Massachusetts, New York, Michigan, northern Illinois, Nebraska, Oregon and Washington; and from 36° to 44° for Maine, parts of New Hampshire and Vermont, Wisconsin, Minnesota, the whole crest of the Rocky Mountains, and parts of Oregon and California along the Sierras. The annual rainfall ranges from 56 to 64 inches in the S. of Florida and along the N. W. Pacific coast; 44 to 56 inches over the New England coast and the greater part of the Southern States, while in New York, Pennsylvania, Illinois, etc., it is 32-44 inches. In Texas, Indian Territory, eastern Kansas and Nebraska, Dakota and Minnesota, and western California, it is 20-32 inches, while in the tract between 98° and 118° it ranges from 18 to 4 inches. Malarial diseases prevail in the lowlands of most of the Southern States, as also in the new and marshy portions of the Western States below lat. 40° N. Consumption and chest diseases prevail in New England and in the Middle States. Minnesota, Colorado, California, Arkansas, Georgia, and Florida are favorite resorts for persons with weak lungs. On the whole, the climate of the United States may be called healthy, malarious and deadly spots being very few; while certain districts, especially of Florida, the central plains, and the Pacific coast, are among the most salubrious in the world.

Geology and Mineralogy.—Geologically as well as geographically the United States is divided into two great sections by the Rocky Mountains, along whose whole extent, in a wide belt from N. to S., Cretaceous formations predominate, with occasional stretches of Carboniferous strata. Tertiary formations embrace almost the whole of the basin between the Rocky Mountains and the Coast Range, broken by igneous rocks in Washington and in Oregon, and by Metamorphic strata along the Sierras; in the E. section Tertiary formations stretch along the coast from the Rio Grande almost to the Hudson. Metamorphic, igneous, and Devonian rocks prevail in New England, and along the shores of the Great Lakes the Middle Devonian or Old Red Sandstone. Older Palæozoic groups occur in Wisconsin, Ohio, and Tennessee, and run side by side with Metamorphic strata along the Appalachians, while a large proportion of the interior is occupied by great Carboniferous deposits. Anthracite coal occurs in the basins of Pennsylvania, which embrace about 472 square miles, and extend to a depth of from 60 to 100 feet. The Eastern coal fields embrace an area of over 69,000 square miles; the interior, 132,000 square miles; the Gulf, 2,100; the Northern, 88,590; the Rocky Mountain, 37,000, and the Pacific coast, 1,900. (See COAL). The ores of iron abound in the States, and include all known ores. The ore beds most largely worked are in Minnesota, Michigan, Alabama, Wisconsin, New York, Tennessee, Virginia, and New Jersey. Copper ore is found chiefly in Arizona, Michigan, Montana, Utah, Nevada, New Mexico, California, Tennessee, Alaska, Illinois, Kansas and Oklahoma; lead ores (galena) in Missouri, Idaho, Utah, etc., quicksilver in California and Nevada. Gold and silver

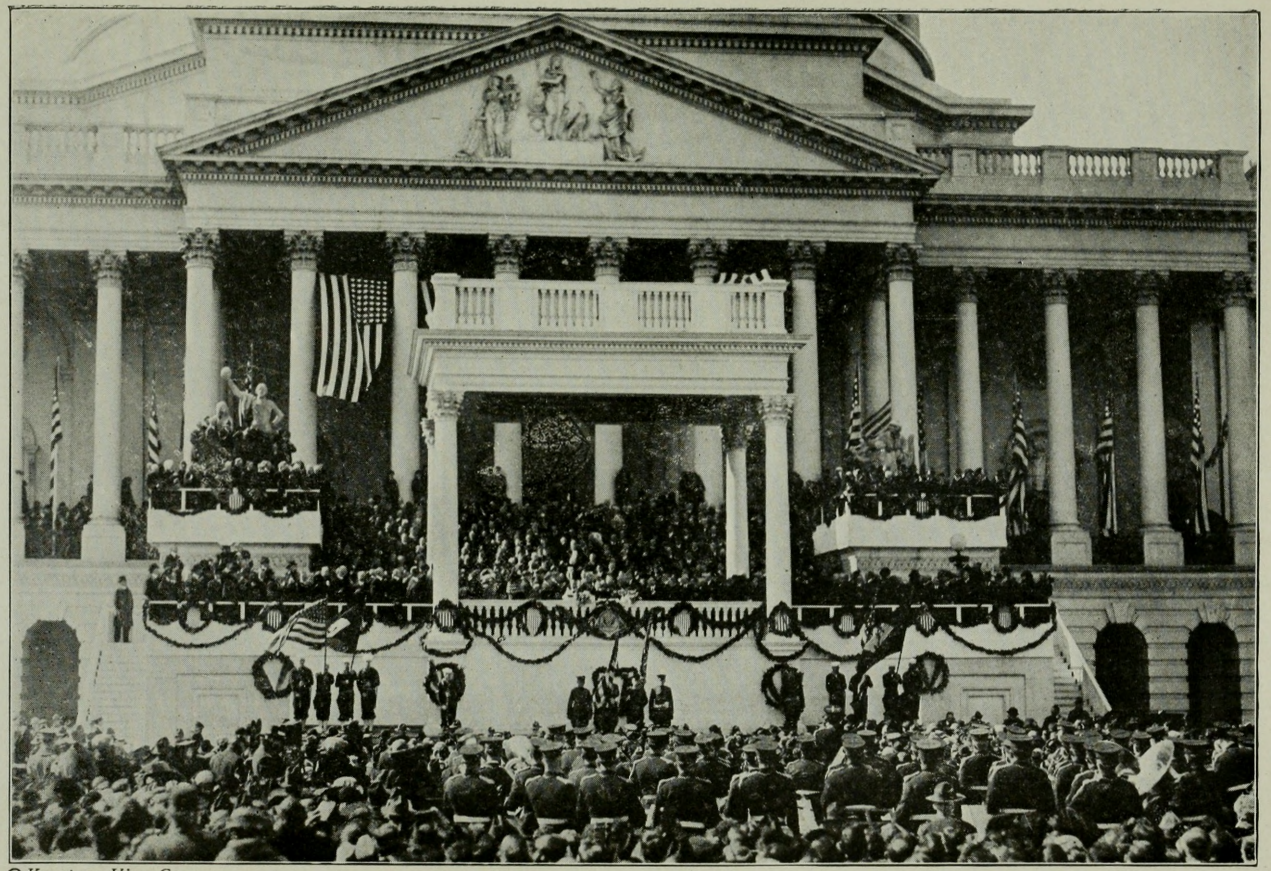
are widely distributed, 24 States and Territories reporting them; but California, Colorado, Nevada, Montana, Arizona, South Dakota, and Utah produce the larger part; Nevada alone about one-half. Nevada, Utah, and Arizona yield more silver than gold.

Flora and Fauna.—The indigenous plants of the United States are estimated at about 5,000 species, California alone producing at least 2,500. The potato, the tobacco plant, and maize, now so familiar in Europe, have all been introduced from the United States or Mexico. The United States is especially rich in valuable timber trees, of which no less than 120 species, growing in sufficient quantities to be of commercial importance, attain a height of 100 feet and upward. Of these 12 species reach an altitude of 200 feet, and 5 or 6 exceed 300 feet. Hickory, magnolia, liquid-amber, sassafras, and sequoia trees (to which species belong the giant trees of California), found only in a fossil state in the Old World, abound in the United States, as well as palmetto, tulip tree, cypress, cottonwood, live oak, and other oaks, and a number of trees more or less closely resembling the common species of western Europe, to which the same names have been given.

Agriculture and Live Stock.—For the aggregate acreage, production, and values of the principal agricultural crops, see AGRICULTURE, the several State and Territorial articles, and the individual crop articles. For the production and manufacture of COTTON see article thereon. Manufactures in respect to product constitute the leading industry of the United States, and their importance is increasing more rapidly than that of agriculture. The manufacturing section is situated mainly in the North Atlantic States, spreading with diminishing importance W., following closely the distribution of the urban population. About half of the manufactured product comes from the nine States included in the North Atlantic group, and about one-third from the North Central States.

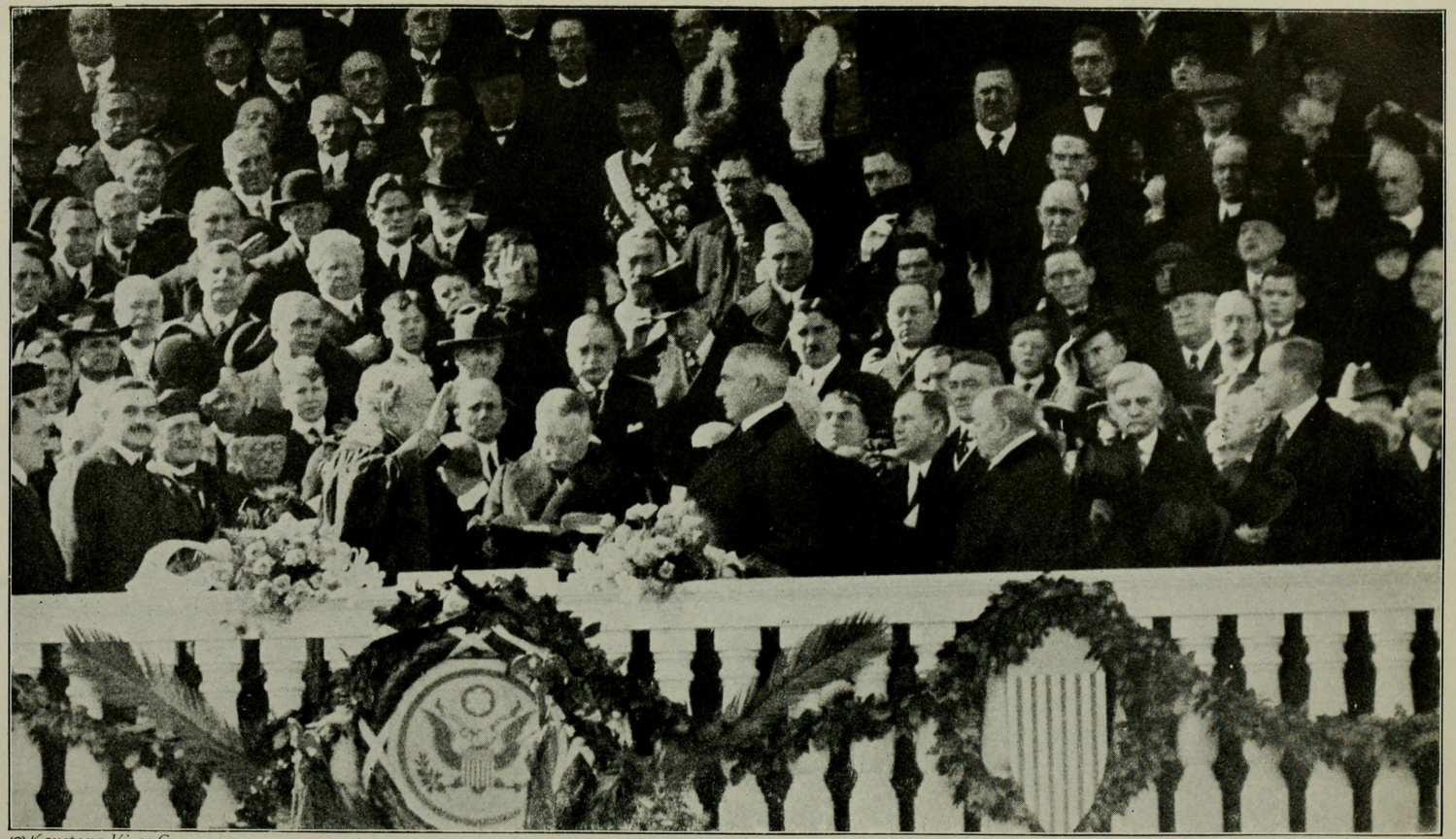
Manufactures.—The following table presents a summary of the manufacturing interests of the United States in 1899, 1904, 1909 and 1914:

Group	Year	Establishments	Average Wage Earners	Cost of Materials—Amount	Value of Products	Value Added by Manufacture
Food and kindred products.	1899	41,247	301,868	$1,782,863,000	$2,199,204,000	$416,341,000
	1904	45,857	354,046	2,306,121,000	2,845,556,000	539,435,000
	1909	55,364	411,575	3,187,803,000	3,937,618,000	749,815,000
	1914	59,317	496,234	3,828,512,000	4,816,709,000	988,197,000
Textiles	1899	17,647	1,022,123	894,846,000	1,628,606,000	733,760,000
	1904	17,042	1,156,305	1,246,562,000	2,147,441,000	900,879,000
	1909	21,723	1,438,446	1,745,516,000	3,060,199,000	1,314,683,000
	1914	22,995	1,498,664	1,993,058,000	3,414,615,000	1,421,557,000
Iron and steel and their products	1899	14,082	745,235	1,000,949,000	1,819,478,000	818,529,000
	1904	14,431	868,634	1,190,794,000	2,199,776,000	1,008,982,000
	1909	17,292	1,026,553	1,799,942,000	3,164,472,000	1,364,530,000
	1914	17,719	1,061,058	1,762,313,000	3,223,144,000	1,460,831,000
Lumber and its manufactures	1899	34,954	671,696	480,930,000	1,007,532,000	526,602,000
	1904	32,501	734,136	517,501,000	1,219,749,000	702,248,000
	1909	48,539	911,593	717,833,000	1,588,274,000	870,441,000
	1914	42,036	833,529	762,350,000	1,599,710,000	837,360,000
Leather and its finished products	1899	5,625	248,626	396,633,000	582,048,000	185,415,000
	1904	5,318	264,459	480,221,000	724,391,000	244,170,000
	1909	5,728	309,766	669,874,000	992,713,000	322,839,000
	1914	6,758	307,060	753,135,000	1,104,595,000	351,460,000
Paper and printing	1899	26,627	298,744	214,566,000	607,907,000	393,341,000
	1904	30,803	351,640	309,012,000	859,814,000	550,802,000
	1909	34,828	415,990	451,239,000	1,179,285,000	728,046,000
	1914	37,196	452,900	580,715,000	1,456,046,000	875,331,000
Liquors and beverages	1899	5,740	55,120	93,815,000	382,898,000	289,083,000
	1904	6,379	68,338	139,849,000	501,254,000	361,405,000
	1909	7,347	77,827	186,128,000	674,311,000	488,183,000
	1914	7,562	88,152	246,188,000	772,080,000	525,892,000
Chemicals and allied products	1899	8,928	196,538	451,457,000	761,691,000	310,234,000
	1904	9,826	227,326	633,919,000	1,075,519,000	441,600,000
	1909	12,060	267,261	931,045,000	1,526,599,000	595,554,000
	1914	12,374	299,569	1,289,348,000	2,001,634,000	712,286,000
Stone, clay, and glass products	1899	11,524	231,716	85,137,000	270,650,000	185,513,000
	1904	10,773	285,346	123,067,000	391,148,000	268,081,000
	1909	16,168	342,827	183,792,000	531,737,000	347,945,000
	1914	14,747	334,702	238,734,000	614,162,000	375,428,000



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PRESIDENTIAL INAUGURAL, MARCH 4, 1921, ON THE EAST FRONT OF THE CAPITOL



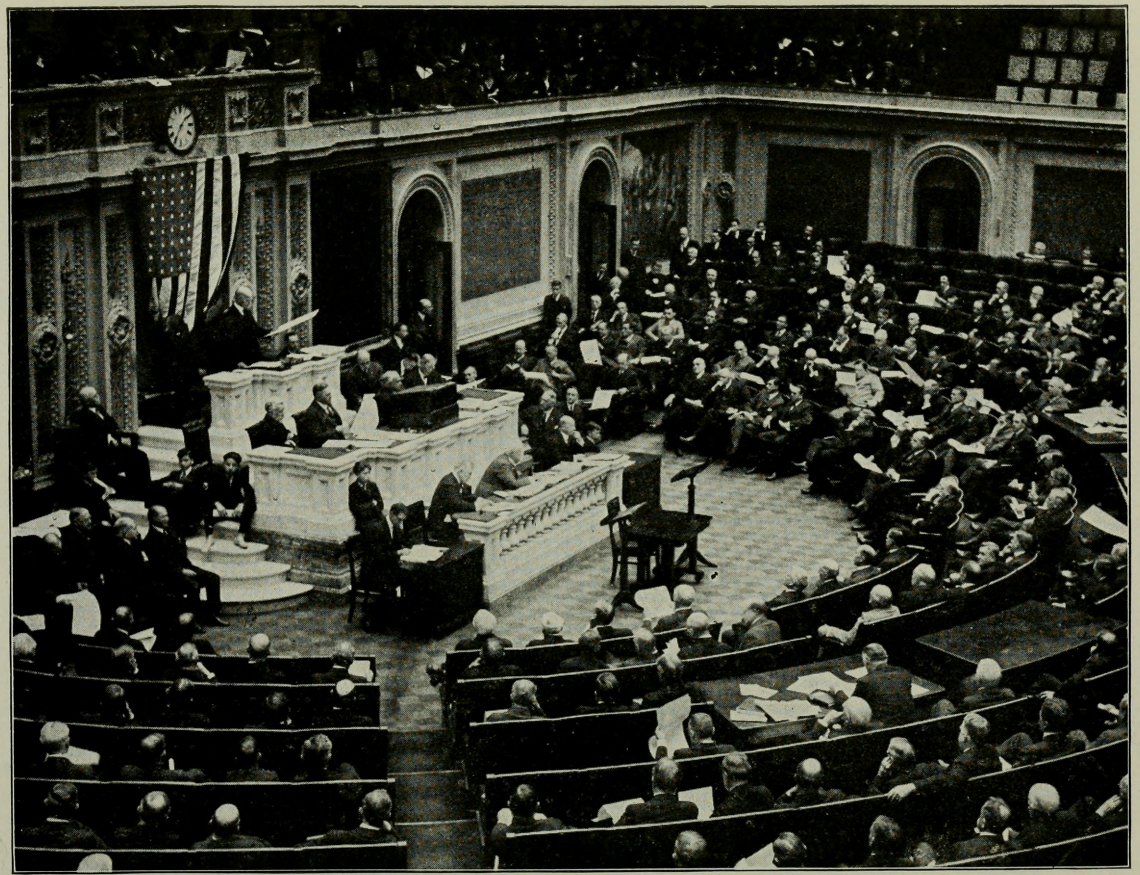
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WARREN GAMALIEL HARDING TAKING THE OATH OF OFFICE IN THE INAUGURAL CEREMONIES, MARCH 4, 1921



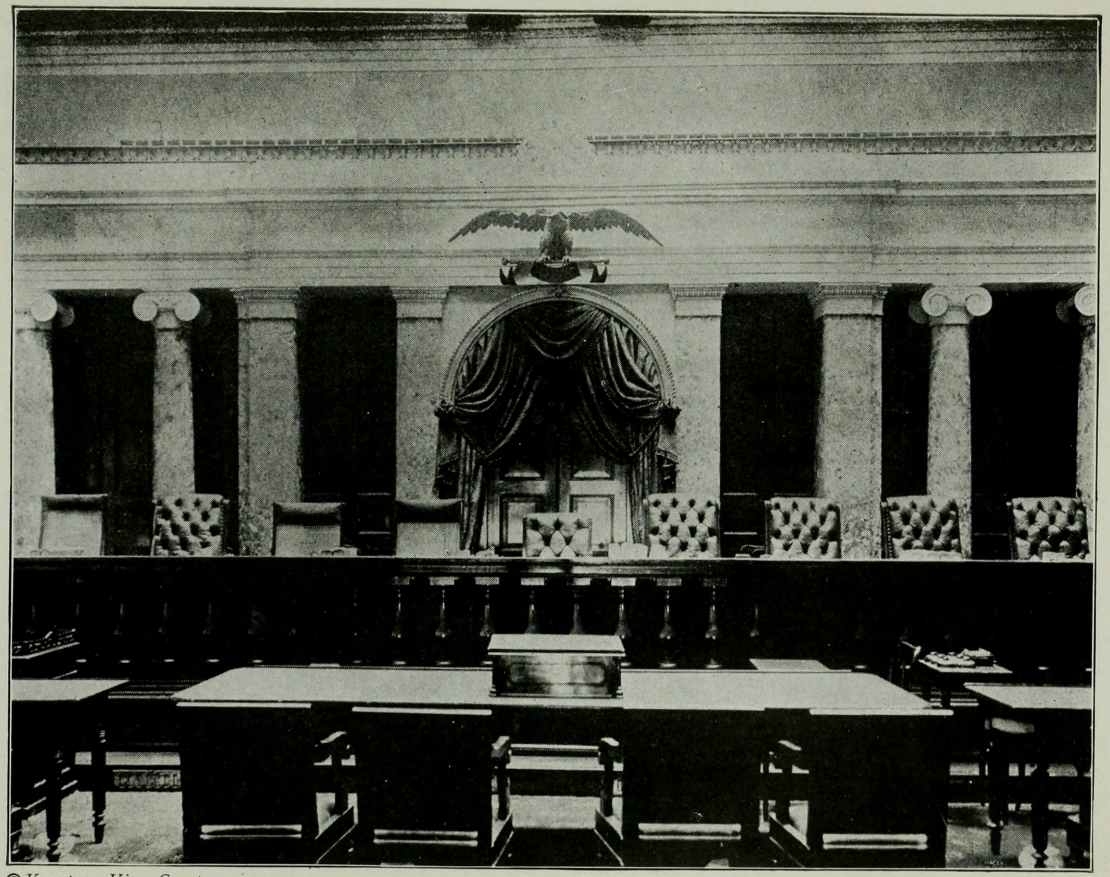
Photo, Clinedinst Studio

PRESIDENT HARDING AND HIS CABINET, AT THEIR FIRST CABINET MEETING, MARCH, 1921—HARDING, MELLON, DAUGHERTY, DANBY, WALLACE, DAVIS, COOLIDGE, HOOVER, FALL, HAYS, WEEKS, HUGHES



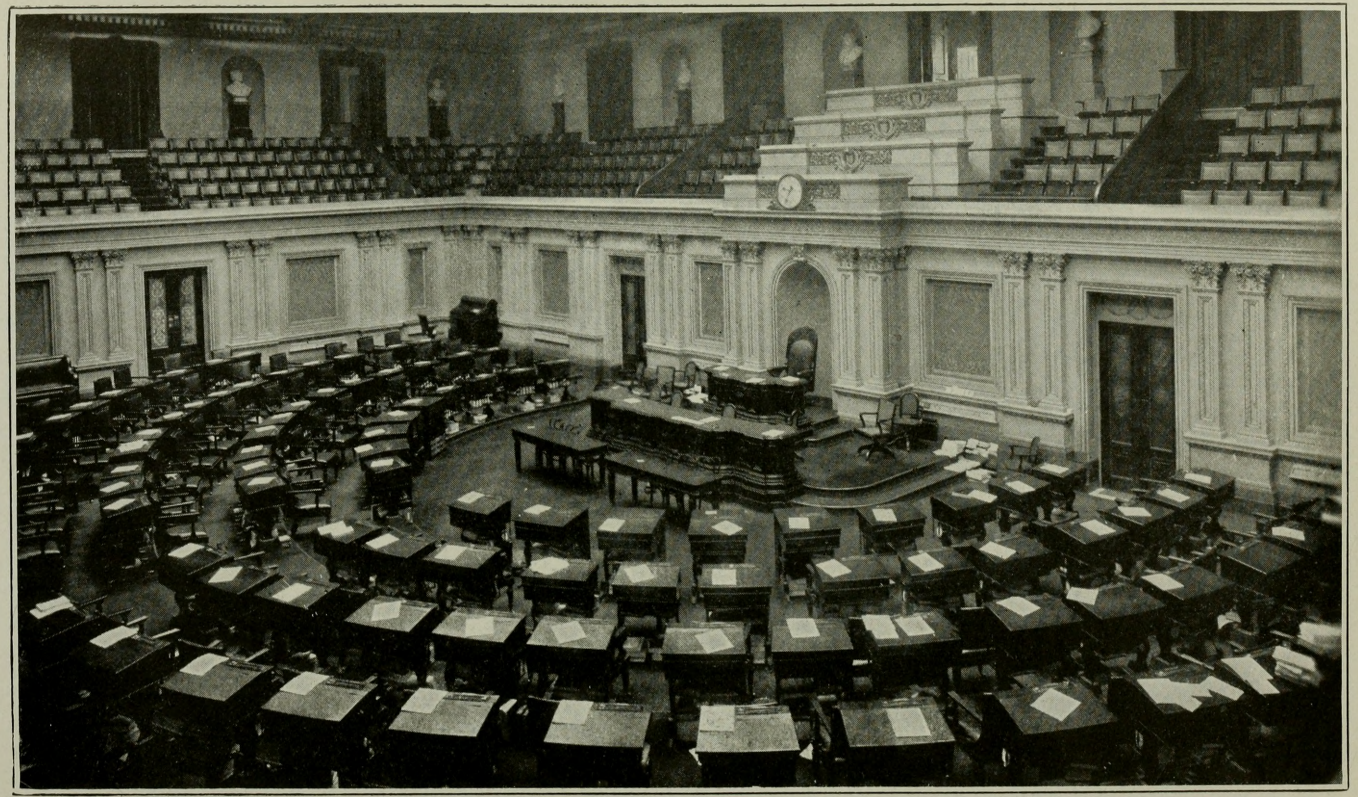
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COUNTING THE ELECTORAL VOTE FOR PRESIDENT AND VICE PRESIDENT IN THE HOUSE OF REPRESENTATIVES



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THE SUPREME COURT CHAMBER IN THE CAPITOL



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THE SENATE CHAMBER IN THE CAPITOL, WASHINGTON, D. C.

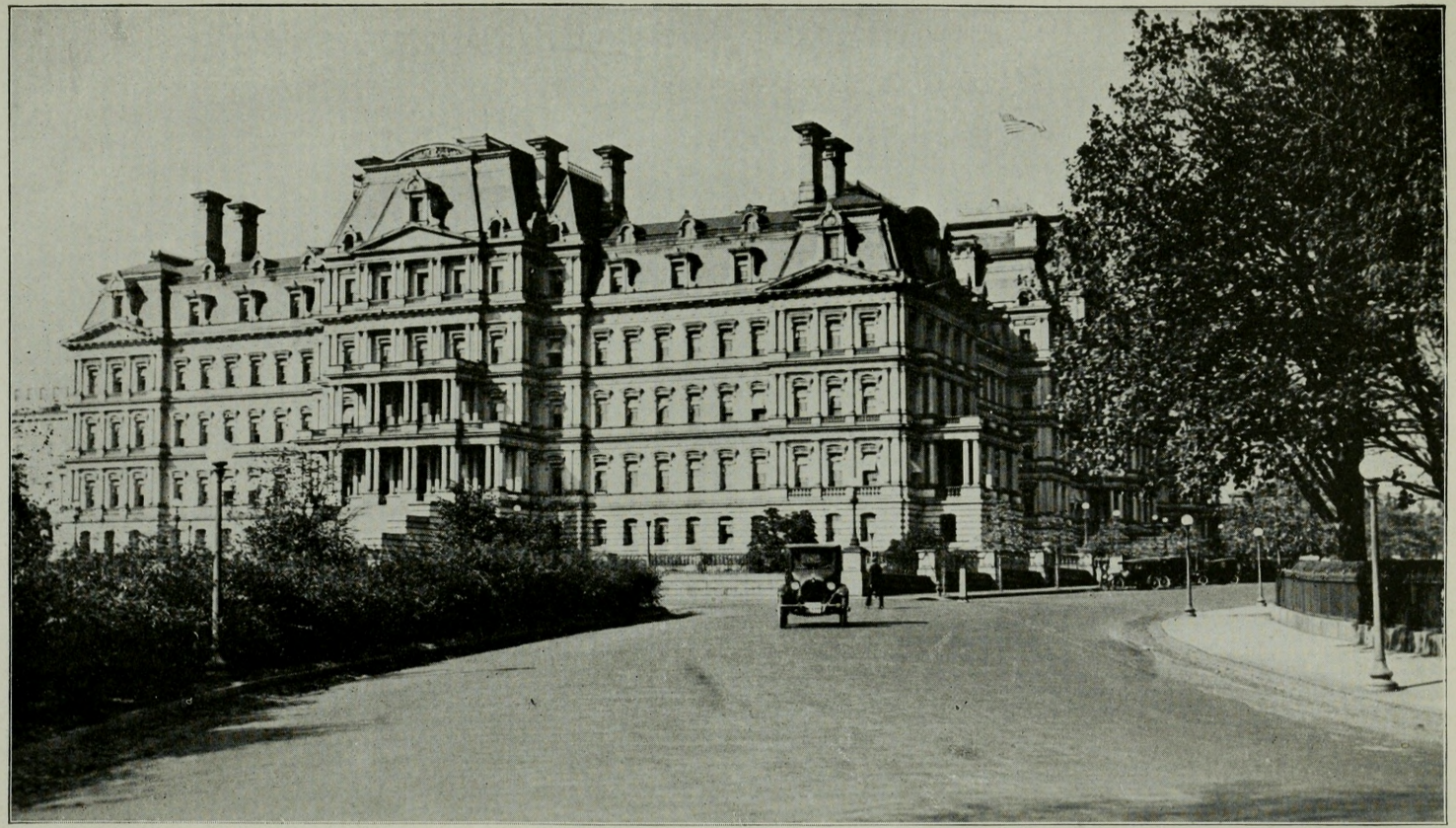


Photo by Ewing Galloway

THE STATE, ARMY, AND NAVY BUILDING, WASHINGTON, D. C.



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THE WHITE HOUSE, WASHINGTON, D. C.

Group	Year	Establishments	Average Wage Earners	Cost of Materials—Amount	Value of Products	Value Added by Manufacture
Metals and metal products, other than iron and steel.	1899	5,041	161,463	$472,515,000	$690,974,000	$218,459,000
	1904	5,880	198,531	633,132,000	895,975,000	262,843,000
	1909	8,783	249,607	892,065,000	1,240,410,000	348,345,000
	1914	10,023	262,154	1,023,354,000	1,417,042,000	393,688,000
Tobacco manufactures	1899	14,959	132,526	92,867,000	263,713,000	170,846,000
	1904	16,827	159,406	126,086,000	331,111,000	205,025,000
	1909	15,822	166,810	177,186,000	416,695,000	239,509,000
	1914	13,951	178,872	207,134,000	490,165,000	283,031,000
Vehicles for land transportation.....	1899	7,338	133,663	153,254,000	277,485,000	124,231,000
	1904	6,058	136,625	177,641,000	320,624,000	142,983,000
	1909	6,562	202,719	306,537,000	561,763,000	255,226,000
	1914	9,909	263,076	586,670,000	1,034,497,000	447,827,000
Railroad repair shops.....	1899	1,400	180,620	113,809,000	227,485,000	113,676,000
	1904	1,226	247,922	156,568,000	323,212,000	166,644,000
	1909	1,686	304,592	214,581,000	437,563,000	222,982,000
	1914	2,011	365,902	261,439,000	552,618,000	291,179,000
Miscellaneous industries....	1899	12,402	332,825	342,210,000	687,256,000	345,046,000
	1904	13,259	415,669	459,735,000	958,333,000	498,598,000
	1909	16,589	489,480	679,250,000	1,360,413,000	681,163,000
	1914	19,193	594,465	835,139,000	1,749,418,000	914,279,000
All industries.....	1899	207,514	4,712,763	6,575,851,000	11,406,927,000	4,831,076,000
	1904	216,180	5,468,383	8,500,208,000	14,793,903,000	6,293,695,000
	1909	268,491	6,615,046	12,142,791,000	20,672,052,000	8,529,261,000
	1914	275,791	7,036,337	14,368,089,000	24,246,435,000	9,878,346,000

Commerce.—The subjoined table is a summary of the foreign trade of the United States in the year ending June 30, 1920:

Groups	Twelve Months Ending June 30, 1920	
	Dollars	Per Cent.
MERCHANDISE		
Imports		
Free of duty:		
Crude materials for use in manufacturing.....	1,912,403,056	56.16
Foodstuffs in crude condition, and food animals	547,376,705	16.07
Foodstuffs partly or wholly manufactured..	65,895,555	1.94
Manufactures for further use in manufacturing..	518,921,062	15.24
Manufactures ready for consumption	331,090,664	9.72
Miscellaneous	29,762,752	.87
Total free of duty...	3,405,449,794	100.00
Dutiable:		
Crude materials for use in manufacturing.....	229,241,565	12.50
Foodstuffs in crude condition, and food animals	75,063,040	4.09
Foodstuffs partly or wholly manufactured..	825,440,909	45.04
Manufactures for further use in manufacturing..	281,792,221	15.37
Manufactures ready for consumption	414,035,025	22.59
Miscellaneous	7,599,114	.41
Total dutiable.....	1,833,171,874	100.00
Free and dutiable:		
Crude materials for use in manufacturing.....	2,141,644,621	40.89
Foodstuffs in crude condition, and food animals	622,439,745	11.88
Foodstuffs partly or wholly manufactured..	891,336,464	17.02
Manufactures for further use in manufacturing..	800,713,283	15.28
Manufactures ready for consumption	745,125,689	14.22
Miscellaneous	37,361,866	.71
Total imports of merchandise	5,238,621,668	100.00
Per cent. free.....	.....	65.01
Duties collected from customs	322,902,649	.....
Average ad valorem rate of duty, based on imports for consumption.....	.....	6.31
Remaining in warehouse at the end of the month..	.....	.....
Exports		
Domestic:		
Crude materials for use in manufacturing.....	1,968,118,442	24.75
Foodstuffs in crude condition, and food animals	626,577,003	7.88
Foodstuffs partly or wholly manufactured..	1,514,616,127	19.05
Manufactures for further use in manufacturing..	991,920,623	12.48
Manufactures ready for consumption	2,835,999,005	35.67
Miscellaneous	13,197,980	.17
Total domestic.....	7,950,429,180	100.00
Foreign	160,610,553	.....
Total exports.....	8,111,039,733	.....
Excess of exports...	2,872,418,065	.....

Groups	Twelve Months Ending June 30, 1920	
	Dollars	Per Cent.
WATER-BORNE COMMERCE		
Imports:		
In American vessels	1,836,026,959	39.01
In foreign vessels	2,870,930,209	60.99
Total (except in land vehicles)	4,706,957,168	100.00
Exports:		
In American vessels	3,235,879,022	45.14
In foreign vessels	3,932,588,373	54.86
Total (except in land vehicles)	7,168,467,395	100.00
GOLD AND SILVER		
Gold:		
Imports	150,540,200	.....
Exports	466,592,606	.....
Silver:		
Imports	102,899,506	.....
Exports	179,037,260	.....
TONNAGE OF VESSELS	Net Tons	
Entered:		
American	26,242,330	50.06
Foreign	26,178,328	49.94
Total entered	52,420,658	100.00
Cleared:		
American	28,997,549	51.72
Foreign	27,074,832	48.28
Total cleared	56,072,381	100.00

Railroads.—The following table gives the railway mileage of the United States on Jan. 1, 1919:

State or Territory	Total Mileage Operated
Alabama	5,607.86
Arizona	2,390.56
Arkansas	5,418.62
California	8,499.01
Colorado	5,610.95
Connecticut	998.14
Delaware	340.51
Florida	5,299.53
Georgia	7,699.94
Idaho	2,913.13
Illinois	13,275.04
Indiana	7,707.60
Iowa	10,129.23
Kansas	9,556.74
Kentucky	4,073.29
Louisiana	5,645.84
Maine	2,352.49
Maryland	1,464.84
Massachusetts	2,134.16
Michigan	8,969.29
Minnesota	9,392.32
Mississippi	4,450.58
Missouri	8,810.56
Montana	5,094.12
Nebraska	6,254.61
Nevada	2,191.04
New Hampshire	1,250.35
New Jersey	2,513.63
New Mexico	3,060.27
New York	8,722.14
North Carolina	5,615.41
North Dakota	5,295.01
Ohio	9,665.38
Oklahoma	6,558.87
Oregon	3,404.72
Pennsylvania	12,476.15
Rhode Island	211.60
South Carolina	3,850.00
South Dakota	4,284.14
Tennessee	4,173.60
Texas	16,713.91
Utah	2,222.38
Vermont	1,081.06
Virginia	4,803.76
Washington	6,292.09
West Virginia	4,007.70
Wisconsin	7,736.18
Wyoming	1,929.62
Alaska	.....
District of Columbia	53.57
Hawaii	.....
United States:	
Dec. 31, 1918	262,201.54
Dec. 31, 1917	263,928.65
Dec. 31, 1916	264,232.01
June 30, 1916	264,024.77
June 30, 1915	262,358.97

Canals.—The principal canals in the United States, the year of opening, and their total length, are as follows:

Name of Canal, and State	Year	Miles
Cape Cod Ship Canal, Mass.	1914	13
Erie, and Branches, N. Y.	1825	340.4
Delaware and Raritan, N. J.	1834	44
Schuylkill Navigation Co., Pa.	1825	86.96
Chesapeake and Ohio, Md.	1850	184.5
Illinois and Michigan, Ill.	1848	95
Chicago Drainage and Ship Canal, Ill.	1900	38.6
Illinois and Mississippi, Ill.	1907	75
Galveston and Brazos, Tex.	....	36
Monongahela Canal, Pa.	1879	128
Ohio Canal, Pa.	1885	968.5
Muskingum, Ohio	1840	91
Illinois Canal, Ill.	1889	223
Fox Canal, Wis.	1856	176
Cumberland Canal, Tenn. and Ky.	1905	326
Black Warrior, Ala.	1895	362
Coosa Canal, Ala.	1890	165
Trinity River, Texas	1909	330
Brazos River, Texas	1915	425

Religion and Education.—There is no State or officially recognized religion in the United States. Every form of religious belief is tolerated by National and State laws, but no sectarian distinctions are permitted to be considered in public legislation, the prevailing sentiment of the country being that each sect or denomination must maintain itself without any public aid. The Roman Catholic is the most powerful religious body. Its membership as reported represents the entire Roman Catholic population as compared with the communicant members of other denominations. It is derived from various sources spread widely over the country. In the Northeastern States it is made up largely of Irish and French-Canadian stock, while further

W. along the shores of the Great Lakes the Roman Catholics are chiefly French Canadians by birth or extraction. The Methodist and Baptist denominations are strongest in the Southern States; the Presbyterian in the Middle and Southern States and the upper Mississippi valley; the Episcopalian in the Northeastern States; and the Congregational mostly in New England. The educational establishment is treated very fully under titles that will readily suggest themselves to the reader, covering the public or common schools, the secondary, and the advanced and professional institutions.

Banking and Insurance.—The progress and results of banking legislation, from the earliest period to the latest Act of Congress bearing thereon, are set forth under BANK, BANKS IN THE UNITED STATES, each title showing the latest official statistics available. Under the title of INSURANCE will be found mention of the kinds in operation, with an approximate view of present conditions.

Revenue and Expenditure.—The following table shows the receipts and disbursements of the Government for the fiscal year 1921:

COMPARATIVE ANALYSIS OF RECEIPTS AND DISBURSEMENTS

RECEIPTS

Ordinary

Customs	$150,097,265.73
Internal revenue:	
Income and profits tax	1,628,203,930.54
Miscellaneous	770,064,311.20
Miscellaneous revenue	*415,452,127.16
Panama Canal tolls, etc.	3,701,642.85
Total ordinary	$2,967,519,277.48
Excess of ordinary receipts over ordinary disbursements	$459,504,944.43
Excess of ordinary disbursements over ordinary receipts	

Public Debt

Liberty bonds and Victory notes	35,075.00
Certificates of indebtedness	4,613,223,450.00
War-savings securities	12,142,660.18
Postal Savings bonds	72,800.00
Deposits for retirement of National bank notes and Federal Reserve bank notes (acts of July 14, 1890, and Dec. 23, 1913)	7,548,147.50
Total	4,633,022,132.68
Grand total receipts	7,600,541,410.16

DISBURSEMENTS

Ordinary

Checks and warrants paid (less balances repaid, etc.)	1,950,396,545.30
Interest on public debt paid	478,418,864.44
Panama Canal: Checks paid (less balances repaid, etc.)	6,028,931.76
Purchase of obligations of foreign Governments	57,201,633.53
Purchase of Federal farm loan bonds:	
Principal	15,850,000.00
Accrued interest	118,358.08
Total ordinary	2,508,014,333.05

Public Debt

Bonds, interest-bearing notes, and certificates retired	4,937,738,624.14
National bank notes and Federal Reserve bank notes retired (acts of July 14, 1890, and Dec. 23, 1913)	7,538,741.00
Total	4,945,277,365.14
Grand total disbursements	$7,453,291,698.19

*Includes $30,000,000 received from United States Sugar Equalization Board (Inc.), as dividend on capital stock owned by United States, and $60,724,742.27 received from Federal Reserve banks as franchise tax.

Debt.—The following is the official statement of the public debt Dec. 31, 1920:

Total gross debt, Nov. 30, 1920		$24,175,156,244.14
Public-debt receipts, Dec. 1 to 31, 1920	$1,412,328,847.46	
Public-debt disbursements, Dec. 1 to 31, 1920	1,600,418,856.99	
	188,090,009.53	
*Decrease in fractional currency outstanding	4,842,066.45	
Decrease for period		192,932,075.98
Total gross debt, Dec. 31, 1920		$23,982,224,168.16

NOTE.—Total gross debt before deduction of the balance held by the Treasurer free of current obligations, and without any deduction on account of obligations of foreign Governments or other investments, was as follows:

Bonds:		
Consols of 1930	$599,724,050.00	
Loan of 1925	118,489,900.00	
Panama's of 1916-1936	48,954,180.00	
Panama's of 1918-1938	25,947,400.00	
Panama's of 1961	50,000,000.00	
Conversion Bonds	28,894,500.00	
Postal Savings Bonds	11,612,160.00	
		$883,622,190.00
First Liberty Loan	1,952,368,450.00	
Second Liberty Loan	3,323,137,800.00	
Third Liberty Loan	3,646,868,400.00	
Fourth Liberty Loan	6,363,733,163.00	
		15,286,107,813.00
Total bonds		$16,169,730,003.00

Notes:		
Victory Liberty Loan		$4,225,970,755.00
Treasury Certificates:		
Tax	$1,651,694,500.00	
Loan	648,961,500.00	
Pittman Act	259,375,000.00	
Special Issues	32,854,450.00	
		2,592,885,450.00
War Savings Securities (net cash receipts)		760,953,780.53
Total interest-bearing debt		23,749,539,988.53
Debt on which interest has ceased		7,441,490.26
Noninterest-bearing debt		225,242,689.37
Total gross debt		$23,982,224,168.16

*On the basis of estimates by the Government Actuary, the amount of fractional currency outstanding on Dec. 31, 1920, is carried at $2,000,000, a reduction of $4,842,066.45 on account of fractional currency estimated to have been irrevocably lost or destroyed in circulation.

Defenses.—See ARMY; MILITARY ORGANIZATION, UNITED STATES; NAVY.

Pensions.—The number of pensioners on the roll at the end of the fiscal year 1920 was 592,190. The number of Civil War pensioners was 243,520, or a decrease of 27,871 during the year. There were 290,100 Civil War widows on the pension rolls. Of the War of 1812, there were on June 30, 1920, 71 surviving widows, and of the war with Mexico, 148 survivors and 2,432 widows. The pensioners of the Spanish-American War numbered 30,432. The total amount disbursed for pensions throughout the year was $213,295,314.

Post Office.—The revenue of the postal service for the fiscal year ending June 30, 1919, amounted to $436,239,126. The Act of Congress passed on November 7, 1917, increasing the postage rates, expired by limitation on June 30, 1919. The expenditure for the year was $362,497,635. In 1919 and 1920 mail service by aeroplane was developed to a point of practical value. Service was maintained between New York and Chicago, and other large cities. There were in 1919 565,509 depositors in the postal savings banks, with deposits of $167,323,260.

Population.—The population of the United States from 1790 to 1890 was as follows:

1790	3,929,214
1800	5,308,483
1810	7,239,881
1820	9,638,453
1830	12,866,020
1840	17,069,453
1850	23,191,876
1860	31,443,321
1870	38,558,371
1880	50,155,783
1890	62,947,714

The following table shows the population by States, compiled from the census reports for 1900, 1910, and 1920:

See also CENSUS.

POPULATION OF THE UNITED STATES, BY STATES: 1920, 1910, AND 1900

State	Population			Increase* 1910-1920		Increase* 1900-1910	
	1920	1910	1900	Number	Per cent.	Number	Per cent.
United States	105,710,620	91,972,266	75,994,575	13,736,505	14.9	15,977,691	21.0
Alabama	2,348,174	2,138,093	1,828,697	210,081	9.8	309,396	16.9
Arizona	334,162	204,354	122,931	129,808	63.5	81,423	66.2
Arkansas	1,752,204	1,574,449	1,311,564	177,755	11.3	262,885	20.0
California	3,426,861	2,377,549	1,485,053	1,049,312	44.1	892,496	60.1
Colorado	939,629	799,024	539,700	140,605	17.6	259,324	48.0
Connecticut	1,380,631	1,114,756	908,420	265,875	23.9	206,336	22.7
Delaware	223,003	202,322	184,735	20,681	10.2	17,587	9.5
District of Columbia	437,571	331,069	278,718	106,502	32.2	52,351	18.8
Florida	968,470	752,619,	528,542	215,851	28.7	224,077	42.4
Georgia	2,895,832	2,609,121	2,216,331	286,711	11.0	392,790	17.7
Idaho	431,866	325,594	161,772	106,272	32.6	163,822	101.3
Illinois	6,485,280	5,638,591	4,821,550	846,689	15.0	817,041	16.9
Indiana	2,930,390	2,700,876	2,516,462	229,514	8.5	184,414	7.3
Iowa	2,404,021	2,224,771	2,231,853	179,250	8.1	–7,082	–0.3
Kansas	1,769,257	1,690,949	1,470,495	78,308	4.6	220,454	15.0
Kentucky	2,416,630	2,289,905	2,147,174	126,725	5.5	142,731	6.6
Louisiana	1,798,509	1,656,388	1,381,625	142,121	8.6	274,763	19.9
Maine	768,014	742,371	694,466	25,643	3.5	47,905	6.9
Maryland	1,449,661	1,295,346	1,188,044	154,315	11.9	107,302	9.0
Massachusetts	3,852,356	3,366,416	2,805,346	485,940	14.4	561,070	20.0
Michigan	3,668,412	2,810,173	2,420,982	858,239	30.5	389,191	16.1
Minnesota	2,387,125	2,075,708	1,751,394	311,417	15.0	324,314	18.5
Mississippi	1,790,618	1,797,114	1,551,270	–6,496	–0.4	245,844	15.8

*A minus sign (–) denotes decrease

POPULATION OF THE UNITED STATES BY STATES: 1920, 1910, AND 1900—*Continued.*

State	Population			Increase* 1910-1920		Increase* 1900-1910	
	1920	1910	1900	Number	Per Cent.	Number	Per Cent.
Missouri	3,404,055	3,293,335	3,106,665	110,720	3.4	186,670	6.0
Montana	548,889	376,053	243,329	172,836	46.0	132,724	54.5
Nebraska	1,296,372	1,192,214	1,066,300	104,158	8.7	125,914	11.8
Nevada	77,407	81,875	42,335	−4,468	−5.5	39,540	93.4
New Hampshire	443,083	430,572	411,588	12,511	2.9	18,984	4.6
New Jersey	3,155,900	2,537,167	1,883,669	618,733	24.4	653,498	34.7
New Mexico	360,350	327,301	195,310	33,049	10.1	131,991	67.6
New York	10,385,227	9,113,614	7,268,894	1,271,613	14.0	1,844,720	25.4
North Carolina	2,559,123	2,206,287	1,893,810	352,836	16.0	312,477	16.5
North Dakota	646,872	577,056	319,146	69,816	12.1	257,910	80.8
Ohio	5,759,394	4,767,121	4,157,545	992,273	20.8	609,576	14.7
Oklahoma	2,028,283	1,657,155	790,391	371,128	22.4	866,764	109.7
Oregon	783,389	672,765	413,536	110,624	16.4	259,229	62.7
Pennsylvania	8,720,017	7,665,111	6,302,115	1,054,906	13.8	1,362,996	21.6
Rhode Island	604,397	542,610	428,556	61,787	11.4	114,054	26.6
South Carolina	1,683,724	1,515,400	1,340,316	168,324	11.1	175,084	13.1
South Dakota	636,547	583,888	401,570	52,659	9.0	182,318	45.4
Tennessee	2,337,885	2,184,789	2,020,616	153,096	7.0	164,173	8.1
Texas	4,663,228	3,896,542	3,048,710	766,686	19.7	847,832	27.8
Utah	449,396	373,351	276,749	76,045	20.4	96,602	34.9
Vermont	352,428	355,956	343,641	−3,528	−1.0	12,315	3.6
Virginia	2,309,187	2,061,612	1,854,184	247,575	12.0	207,428	11.2
Washington	1,356,621	1,141,990	518,103	214,631	18.8	623,887	120.4
West Virginia	1,463,701	1,221,119	958,800	242,582	19.9	262,319	27.4
Wisconsin	2,632,067	2,333,860	2,069,042	298,207	12.8	264,818	12.8
Wyoming	194,402	145,965	92,531	48,437	33.2	53,434	57.7

*A minus sign (—) denotes decrease.

Government.—The form of government of the United States is based on the Constitution of Sept. 17, 1787, to which 10 amendments were added Dec. 15, 1791; an 11th amendment, Jan. 8, 1798; a 12th amendement, Sept. 25, 1804; a 13th amendment, Dec. 18, 1865; a 14th amendment, July 28, 1868; a 15th amendment March 30, 1870; a 16th amendment, Feb. 13, 1913; a 17th amendment, May 31, 1913; an 18th amendment, Jan. 16, 1920, a 19th amendment, Aug. 26, 1920. By the Constitution the government of the nation is intrusted to three separate authorities, the Executive, the Legislative, and the Judiciary. The executive power is vested in a President, who holds his office during the term of four years, and is elected, together with a Vice-President chosen for the same term, in the mode prescribed as follows: "Each State shall appoint, in such manner as the Legislature thereof may direct, a number of electors, equal to the whole number of senators and representatives to which the State may be entitled in the Congress; but no senator or representative, or person holding an office of trust or profit under the United States, shall be appointed an elector." The Constitution enacts that "the Congress may determine the time of choosing the electors, and the day on which they shall give their votes, which day shall be the same throughout the United States"; and further, that "no person except a natural-born citizen, or a citizen of the United States at the time of the adoption of this Constitution, shall be eligible to the office of President; neither shall any person be eligible to that office who shall not have attained the age of 35 years, and been 14 years a resident within the United States." The President is commander-in-chief of the army and navy and of the militia in the service of the Union. He has the power of a veto on all laws passed by Congress; but, notwithstanding his veto, any bill may become a law on its being afterward passed by each House of Congress by a two-thirds vote. The Vice-President is *ex officio* President of the Senate. The presidential succession is fixed by chapter 4 of the acts of the 49th Congress, 1st session. In case of the removal, death, resignation, or inability of both the President and Vice-President, then the Secretary of State shall act as President till the disability of the President or Vice-President is removed or a President is elected. If there be no Secretary of State, then the Secretary of the Treasury will act; and the remainder of the order of succession is: Secretary of War, Attorney-General, Postmaster-General, Secretary of the Navy, and Secretary of the Interior (the office of Secretary of Agriculture was created after the passage of the act. The acting President must, on taking office, convene Congress, if not at the time in session, in extraordinary session, giving 20 days' notice. This act applies only to such Cabinet officers as shall have

been appointed by the advice and consent of the Senate and are eligible under the Constitution to the presidency. Following is a list of the Presidents, Vice-Presidents, and Cabinet officers since the inauguration of the Government:

PRESIDENTS OF THE UNITED STATES

No.	Name	Qualified
1	George Washington	April 30, 1789
	George Washington	March 4, 1793
2	John Adams	March 4, 1797
3	Thomas Jefferson	March 4, 1801
	Thomas Jefferson	March 4, 1805
4	James Madison	March 4, 1809
	James Madison	March 4, 1813
5	James Monroe	March 4, 1817
	James Monroe	March 5, 1821
6	John Quincy Adams	March 4, 1825
7	Andrew Jackson	March 4, 1829
	Andrew Jackson	March 4, 1833
8	Martin Van Buren	March 4, 1837
9	William H. Harrison	March 5, 1841
10	John Tyler	April 6, 1841
11	James K. Polk	March 4, 1845
12	Zachary Taylor	March 5, 1849
13	Millard Fillmore	July 9, 1850
14	Franklin Pierce	March 4, 1853
15	James Buchanan	March 4, 1857
16	Abraham Lincoln	March 4, 1861
	Abraham Lincoln	March 4, 1865
17	Andrew Johnson	April 15, 1865
18	Ulysses S. Grant	March 4, 1869
	Ulysses S. Grant	March 4, 1873
19	Rutherford B. Hayes	March 5, 1877
20	James A. Garfield	March 4, 1881
21	Chester A. Arthur	Sept. 20, 1881
22	Grover Cleveland	March 4, 1885
23	Benjamin Harrison	March 4, 1889
24	Grover Cleveland	March 4, 1893
25	William McKinley	March 4, 1897
	William McKinley	March 4, 1901
26	Theodore Roosevelt	Sept. 14, 1901
	Theodore Roosevelt	March 4, 1905
27	William H. Taft	March 4, 1909
28	Woodrow Wilson	March 4, 1913
	Woodrow Wilson	March 4, 1917
29	Warren G. Harding	March 4, 1921

VICE-PRESIDENTS OF THE UNITED STATES

No.	Name	Qualified
1	John Adams	June 3, 1789
	John Adams	Dec. 3, 1793
2	Thomas Jefferson	March 4, 1797
3	Aaron Burr	March 4, 1801
4	George Clinton	March 4, 1805
	George Clinton	March 4, 1809
	William H. Crawford	April 10, 1812
5	Elbridge Gerry	March 4, 1813
	John Gaillard	Nov. 25, 1814
6	Daniel D. Tompkins	March 4, 1817
	Daniel D. Tompkins	March 5, 1821
7	John C. Calhoun	March 4, 1825
	John C. Calhoun	March 4, 1829
	Hugh L. White	Dec. 28, 1832
8	Martin Van Buren	March 4, 1833
9	Richard M. Johnson	March 4, 1837
10	John Tyler	March 5, 1841
	Samuel L. Southard	April 6, 1841
	Willie P. Mangum	May 31, 1842
11	George M. Dallas	March 4, 1845
12	Millard Fillmore	March 5, 1849
13	William R. King	July 11, 1850
	William R. King	March 4, 1853
	David R. Atchison	April 18, 1853
	Jesse D. Bright	Dec. 5, 1854
14	John C. Breckenridge	March 4, 1857
15	Hannibal Hamlin	March 4, 1861
16	Andrew Johnson	March 4, 1865
	Lafayette S. Foster	April 15, 1865
	Benjamin F. Wade	March 2, 1867
17	Schuyler Colfax	March 4, 1869
18	Henry Wilson	March 4, 1873
	Thomas W. Ferry	Nov. 22. 1875

VICE-PRESIDENTS OF THE UNITED STATES —*Continued*

No.	Name	Qualified
19	William A. Wheeler	March 5, 1877
20	Chester A. Arthur	March 4, 1881
	Thomas F. Bayard	Oct. 10, 1881
	David Davis	Oct. 13, 1881
	George F. Edmunds	March 3, 1883
21	Thomas A. Hendricks	March 4, 1885
	John Sherman	Dec. 7, 1885
22	Levi P. Morton	March 4, 1889
23	Adlai Stevenson	March 4, 1893
24	Garret A. Hobart	March 4, 1897
25	Theodore Roosevelt	March 4, 1901
26	Charles W. Fairbanks	March 4, 1905
27	James S. Sherman	March 4, 1909
28	Thomas R. Marshall	March 4, 1913
	Thomas R. Marshall	March 4, 1917
29	Calvin Coolidge	March 4, 1921

SECRETARIES OF STATE

Name	Residence	Appointed
Thomas Jefferson	Va.	1789
Edmund Randolph	Va.	1794
Timothy Pickering	Mass.	1795
Timothy Pickering	Mass.	1797
John Marshall	Va.	1800
James Madison	Va.	1801
Robert Smith	Md.	1809
James Monroe	Va.	1811
John Quincy Adams	Mass.	1817
Henry Clay	Ky.	1825
Martin Van Buren	N. Y.	1829
Edward Livingston	La.	1831
Louis McLane	Del.	1833
John Forsyth	Ga.	1834
John Forsyth	Ga.	1837
Daniel Webster	Mass.	1841
Daniel Webster	Mass.	1841
Hugh S. Legaré	S. C.	1843
Abel P. Upshur	Va.	1843
John C. Calhoun	S. C.	1844
James Buchanan	Pa.	1845
John M. Clayton	Del.	1849
Daniel Webster	Mass.	1850
Edward Everett	Mass.	1852
William L. Marcy	N. Y.	1853
Lewis Cass	Mich.	1857
Jeremiah S. Black	Pa.	1860
William H. Seward	N. Y.	1861
William H. Seward	N. Y.	1865
Elihu B. Washburne	Ill.	1869
Hamilton Fish	N. Y.	1869
William M. Evarts	N. Y.	1877
James G. Blaine	Me.	1881
F. T. Frelinghuysen	N. J.	1881
Thomas F. Bayard	Del.	1885
James G. Blaine	Me.	1889
John W. Foster	Ind.	1892
Walter Q. Gresham	Ill.	1893
Richard Olney	Mass.	1895
John Sherman	Ohio	1897
William R. Day	Ohio	1897
John Hay	Ohio	1898
Elihu Root	N. Y.	1905
Robert Bacon	N. Y.	1909
Philander C. Knox	Pa.	1909
William J. Bryan	Neb.	1913
Robert Lansing	N. Y.	1915
Bainbridge Colby	N. J.	1921
Charles E. Hughes	N. Y.	1921

SECRETARIES OF THE TREASURY

Name	Residence	Appointed
Alexander Hamilton	N. Y.	1789
Oliver Walcott	Conn.	1795
Oliver Walcott	Conn.	1797
Samuel Dexter	Mass.	1801
Samuel Dexter	Mass.	1801
Albert Gallatin	Pa.	1801
Albert Gallatin	Pa.	1809
George W. Campbell	Tenn.	1814
Alexander J. Dallas	Pa.	1814
William H. Crawford	Ga.	1816

SECRETARIES OF THE TREASURY—*Continued*

Name	Residence	Appointed
William H. Crawford	Ga.	1817
Richard Rush	Pa.	1825
Samuel D. Ingham	Pa.	1829
Louis McLane	Del.	1831
William J. Duane	Pa.	1833
Roger B. Taney	Md.	1833
Levi Woodbury	N. H.	1834
Levi Woodbury	N. H.	1837
Thomas Ewing	Ohio	1841
Thomas Ewing	Ohio	1841
Walter Forward	Pa.	1841
John C. Spencer	N. Y.	1843
George M. Bibb	Ky.	1844
Robert J. Walker	Miss.	1845
William M. Meredith	Pa.	1849
Thomas Corwin	Ohio.	1850
James Guthrie	Ky.	1853
Howell Cobb	Ga.	1857
Philip F. Thomas	Md.	1860
John A. Dix	N. Y.	1861
Salmon P. Chase	Ohio	1861
Williaim P. Fessenden	Me.	1864
Hugh McCulloch	Ind.	1865
Hugh McCulloch	Ind.	1865
George S. Boutwell	Mass.	1869
Wm. A. Richardson	Mass.	1873
Benjamin H. Bristow	Ky.	1874
Lot M. Morrill	Me.	1876
John Sherman	Ohio.	1877
William Windom	Minn.	1881
Charles J. Folger	N. Y.	1881
Walter Q. Gresham	Ind.	1884
Hugh McCulloch	Ind.	1884
Daniel Manning	N. Y.	1885
Charles S. Fairchild	N. Y.	1887
William Windom	Minn.	1889
Charles Foster	Ohio	1891
John G. Carlisle	Ky.	1893
Lyman J. Gage	Ill.	1897
Leslie M. Shaw	Iowa	1902
George B. Cortelyou	N. Y.	1907
Franklin MacVeagh	Ill.	1909
William G. McAdoo	N. Y.	1913
Carter Glass	Va.	1918
David F. Houston	Mo.	1920
Andrew W. Mellon	Pa.	1921

SECRETARIES OF WAR

Name	Residence	Appointed
Henry Knox	Mass.	1789
Timothy Pickering	Mass.	1795
James McHenry	Md.	1796
James McHenry	Md.	1797
John Marshall	Va.	1800
Samuel Dexter	Mass.	1800
Roger Griswold	Conn.	1801
Henry Dearborn	Mass.	1801
William Eustis	Mass.	1809
John Armstrong	N. Y.	1813
James Monroe	Va.	1814
William H. Crowford	Ga.	1815
Isaac Shelby	Ky.	1817
Geo. Graham (*ad in.*)	Va.	1817
John C. Calhoun	S. C.	1817
James Barbour	Va.	1825
Peter B. Porter	N. Y.	1828
John H. Eaton	Tenn.	1829
Lewis Cass	Ohio	1831
Benjamin F. Butler	N. Y.	1837
Joel R. Poinzett	S. C.	1837
John Bell	Tenn.	1841
John Bell	Tenn.	1841
John McLean	Ohio	1841
John C. Spencer	N. Y.	1841
James M. Porter	Pa.	1843
William Wilkins	Pa.	1844
William L. Marcy	N. Y.	1845
George W. Crawford	Ga.	1849
Edward Bates	Mo.	1850
Charles M. Conrad	La.	1850
Jefferson Davis	Miss.	1853
John B. Floyd	Va.	1857
Joseph Holt	Ky.	1861

SECRETARIES OF WAR—*Continued*

Name	Residence	Appointed
Simon Cameron	Pa.	1861
Edwin M. Stanton	Ohio	1862
Edwin M. Stanton	Ohio	1865
U. S. Grant (*ad in.*)	Ill.	1867
Lorenzo Thomas (*ad in.*)	D. C.	1868
John M. Schofied	N. Y.	1868
John A. Rawlins	Ill.	1869
William T. Sherman	Ohio	1869
William W. Belknap	Iowa	1869
Alphonso Taft	Ohio	1876
James Donald Cameron	Pa.	1876
George W. McCrary	Iowa	1877
Alexander Ramsey	Minn.	1879
Robert T. Lincoln	Ill.	1881
Robert T. Lincoln	Ill.	1881
William C. Endicott	Mass.	1885
Redfield Proctor	Vt.	1889
Stephen B. Elkins	W. Va.	1891
Daniel S. Lamont	N. Y.	1893
Russell A. Alger	Mich.	1897
Elihu Root	N. Y.	1899
William H. Taft	Ohio	1904
Luke E. Wright	Tenn.	1908
Jacob M. Dickinson	Tenn.	1909
Henry L. Stimson	Ill.	1911
Lindley M. Garrison	N. J.	1913
Newton D. Baker	Ohio	1916
John W. Weeks	Mass.	1921

SECRETARIES OF THE INTERIOR

Name	Residence	Appointed
Thomas Ewing	Ohio	1849
James A. Pearce	Md.	1850
Thos. M. T. McKernon	Pa.	1850
Alexander H. H. Stuart	Va.	1850
Robert McClelland	Mich.	1853
Jacob Thompson	Miss.	1857
Caleb B. Smith	Ind.	1861
John P. Usher	Ind.	1863
John P. Usher	Ind.	1865
James Harlan	Iowa	1865
Orville H. Browning	Ill.	1866
Jacob D. Cox	Ohio	1869
Columbus Delamo	Ohio	1870
Zachariah Chandler	Mich.	1875
Carl Schurz	Mo.	1877
Samuel J. Kirkwood	Iowa	1881
Henry M. Teller	Col.	1882
Lucius Q. Lamar	Miss.	1885
William F. Vilas	Wis.	1888
John W. Noble	Mo.	1889
Hoke Smith	Ga.	1893
David R. Francis	Mo.	1896
Cornelius N. Bliss	N. Y.	1897
Ethan A. Hitchcock	Mo.	1899
James R. Garfield	Ohio	1907
Richard A. Ballinger	Wash.	1908
Walter L. Fisher	Ill.	1911
Franklin K. Lane	Cal.	1913
John B. Payne	Va.	1920
Albert B. Fall	N. M.	1921

SECRETARIES OF THE NAVY

Name	Residence	Appointed
George Cabot*	Mass.	1798
Benjamin Stoddert	Md.	1798
Benjamin Stoddert	Md.	1801
Robert Smith	Md.	1801
Jacob Crowninshield	Mass.	1805
Paul Hamilton	S. C.	1809
William Jones	Pa.	1813
B. W. Crowninshield	Mass.	1814
B. W. Crowninshield	Mass.	1817
Smith Thompson	N. Y.	1818
Samuel L. Southard	N. J.	1823
Samuel L. Southard	N. J.	1825
John Branch	N. C.	1829
Levi Woodbury	N. H.	1831
Mahlon Dickerson	N. J.	1834

*Appointed by the President and confirmed by the Senate, but did not act.

SECRETARIES OF THE NAVY—*Continued*

Name	Residence	Appointed
Mahlon Dickerson	N. J.	1837
James K. Paulding	N. Y.	1838
George E. Badger	N. C.	1841
George E. Badger	N. C.	1841
Abel P. Upshur	Va.	1841
David Hensha	Mass.	1843
Thomas W. Gilmer	Va.	1844
John Y. Mason	Va.	1844
George Bancroft	Mass.	1845
John Y. Mason	Va.	1846
William B. Preston	Va.	1849
William A. Graham	N. C.	1850
John P. Kennedy	Md.	1852
James C. Dobbin	N. C.	1853
Isaac Toucey	Conn.	1857
Gideon Welles	Conn.	1861
Gideon Welles	Conn.	1865
Adolph E. Borie	Pa.	1869
George M. Robeson	N. J.	1869
Richard W. Thompson	Ind.	1877
Nathan Goff, Jr.	W. V.	1881
William H. Hunt	La.	1881
William E. Chandler	N. H.	1882
William C. Whitney	N. Y.	1885
Benjamin F. Tracy	N. Y.	1885
Hilary A. Herbert	Ala.	1893
John D. Long	Mass.	1897
William H. Moody	Mass.	1902
Paul Morton	Ill.	1904
Charles J. Bonaparte	Md.	1905
Victor H. Metcalf	Cal.	1907
Truman H. Newberry	Mich.	1908
George von L. Meyer	Mass.	1909
Josephus Daniels	N. C.	1913
Edwin C. Denby	Mich.	1921

SECRETARIES OF AGRICULTURE

Name	Residence	Appointed
Norman J. Colman	Mo.	1889
Jeremiah M. Rusk	Wis.	1889
J. Sterling Morton	Neb.	1893
James Wilson	Iowa	1897
David F. Houston	Mo.	1913
Edward T. Meredith	Iowa	1920
Henry C. Wallace	Iowa	1921

POSTMASTERS-GENERAL

Name	Residence	Appointed
Samuel Osgood	Mass.	1789
Timothy Pickering	Mass.	1791
Joseph Habersham	Ga.	1795
Joseph Habersham	Ga.	1797
Gideon Granger	Ga.	1801
Joseph Habersham	Conn.	1801
Gideon Granger	Conn.	1809
Return J. Meigs, Jr.	Ohio	1814
Return J. Meigs, Jr.	Ohio	1817
John McLean	Ohio	1823
John McLean	Ohio	1825
William T. Barry	Ky.	1829
Amos Kendall	Ky.	1835
Amos Kendall	Ky.	1837
John M. Niles	Conn.	1840
Francis Granger	N. Y.	1841
Francis Granger	N. Y.	1841
Charles A. Wickliffe	Ky.	1841
Cave Johnson	Tenn.	1845
Jacob Collamer	Vt.	1849
Nathan K. Hall	N. Y.	1850
Samuel D. Hubbard	Conn.	1852
James Campbell	Pa.	1853
Aaron V. Brown	Tenn.	1857
Joseph Holt	Ky.	1859
Horatio King	Me.	1861
Montgomery Blair	Md.	1861
William Dennison	Ohio	1864
William Dennison	Ohio	1865
Alexander W. Randall	Wis.	1866
John A. J. Creswell	Md.	1869
James W. Marshall	Va.	1874
Marshall Jewell	Conn.	1874

POSTMASTERS-GENERAL—*Continued*

Name	Residence	Appointed
James N. Tyner	Ind.	1876
David McK. Key	Tenn.	1877
Horace Maynard	Tenn.	1880
Thomas L. James	N. Y.	1881
Timothy O. Howe	Wis.	1881
Walter Q. Gresham	Ind.	1883
Frank Hatton	Iowa	1884
William F. Vilas	Wis.	1885
Don M. Dickinson	Mich.	1888
John Wanamaker	Pa.	1889
Wilson S. Bissell	N. Y.	1893
William L. Wilson	W. Va.	1895
James A. Gary	Md.	1897
Charles Emory Smith	Pa.	1898
Henry C. Payne	Wis.	1901
Robert J. Winne	Pa.	1904
George B. Cortelyou	N. Y.	1905
George von L. Meyer	Mass.	1907
Frank H. Hitchcock	Mass.	1909
Albert S. Burleson	Tex.	1913
Will H. Hays	Ind.	1921

The Postmaster-General was not considered a Cabinet officer until 1829.

ATTORNEYS-GENERAL

Name	Residence	Appointed
Edmund Randolph	Va.	1789
William Bradford	Pa.	1794
Charles Lee	Va.	1795
Charles Lee	Va.	1797
Theophilus Parsons	Mass.	1801
Levi Lincoln	Mass.	1801
Robert Smith	Md.	1805
John Breckinridge	Ky.	1805
Cæsar A. Rodney	Del.	1807
Cæsar A. Rodney	Del.	1809
William Pinkney	Md.	1811
Richard Rush	Pa.	1814
Richard Rush	Pa.	1817
William Wirt	Va.	1817
William Wirt	Va.	1825
John McP. Berrien	Ga.	1829
Roger B. Taney	Md.	1831
Bennjamin F. Butler	N. Y.	1833
Bennjamin F. Butler	N. Y.	1837
Felix Grundy	Tenn.	1838
Henry D. Gilpin	Pa.	1840
John J. Crittenden	Ky.	1841
John J. Crittenden	Ky.	1841
Hugh S. Legaré	S. C.	1841
John Nelson	Md.	1843
John Y. Mason	Va.	1845
Nathan Clifford	Me.	1846
Isaac Toucey	Conn.	1848
Reverdy Johnson	Md.	1849
John J. Crittenden	Ky.	1850
Caleb Cushing	Mass.	1853
Jeremiah S. Black	Pa.	1857
Edward M. Stanton	Ohio	1860
Edward Bates	Mo.	1861
Titian J. Coffey (*ad in.*)	Pa.	1863
James Speed	Ky.	1864
James Speed	Ky.	1865
Henry Stanbery	Ohio	1866
William M. Evarts	N. Y.	1868
Ebenezer R. Hoar	Mass.	1869
Amos T. Ackerman	Ga.	1870
George H. Williams	Ore	1871
Edward Pierrepont	N. Y.	1875
Alphonso Taft	Ohio	1876
Charles Devens	Mass.	1877
Wayne MacVeagh	Pa.	1881
Benjamin H. Brewster	Pa.	1881
Augustus H. Garland	Ark.	1885
William H. H. Miller	Ind.	1889
Richard Olney	Mass.	1893
Judson Harmon	Ohio	1895
Joseph McKenna	Cal.	1897
John W. Griggs	N. J.	1897
Philander C. Knox	Pa.	1901
William H. Moody	Mass.	1904
Charles J. Bonaparte	Md.	1907

ATTORNEYS-GENERAL—*Continued*

Name	Residence	Appointed
George W. Wickersham	N. Y.	1909
James C. McReynolds	Tenn.	1913
Thomas W. Gregory	Tex.	1914
A. M. Palmer	Penn.	1919
H. M. Daugherty	Ohio	1921

SECRETARIES OF COMMERCE AND LABOR

Name	Residence	Appointed
George B. Cortelyou	N. Y.	1903
Victor H. Metcalf	Cal.	1904
Oscar S. Straus	N. Y.	1907
Charles Nagel	Mo.	1909

SECRETARIES OF COMMERCE

Name	Residence	Appointed
W. C. Redfield	N. Y.	1913
J. W. Alexander	Mo.	1919
Herbert Hoover	Cal.	1921

SECRETARIES OF LABOR

Name	Residence	Appointed
William B. Wilson	Pa.	1913
James J. Davis	Pa.	1921

The Congress.—The whole legislative power is vested by the Constitution in a Congress, consisting of a Senate and House of Representatives. The Senate consists of two members from each State, chosen by the State Legislatures for six years. Senators must be not less than 30 years of age; must have been citizens of the United States for nine years; and be residents in the State from which they are chosen. Besides its legislative capacity the Senate is invested with the power of confirming or rejecting all appointments to office made by the President, and its members constitute a High Court of Impeachment. The judgment in the latter case extends only to the removal from office and disqualification. Representatives have the sole power of impeachment. The House of Representatives is composed of members elected every second year, by the vote of all citizens over the age of 21 of the several States of the Union, who are qualified in accordance with the laws of their respective States. By the 15th Amendment to the Constitution, neither race nor color affects the right of citizens. The franchise is not absolutely universal; residence for at least one year in most States (in Michigan and Maine three months) is necessary; in some States the payment of taxes, in others registration.

For Judiciary, see JUDICIARY; SUPREME COURT.

History.—The territories now occupied by the United States of America, though they were probably visited on their N. E. coast by Norse navigators about the year 1000, continued in the sole possession of numerous tribes of Indians till the rediscovery of America by Columbus in 1492. In 1498 an English expedition, under the command of Sebastian Cabot, explored the E. coast of America, from Labrador to Virginia, and perhaps to Florida. In 1513 Juan Ponce de Leon landed near St. Augustine, Fla. In 1520 some Spanish vessels from San Domingo were driven upon the coast of Carolina. In 1521, by the conquests of Cortez and his followers, Mexico, including Texas, New Mexico and California, became a province of Spain. In 1539-1542 Ferdinand de Soto led a Spanish expedition from the coast of Florida across Alabama, and discovered the Mississippi river. In 1584-1585 Sir Walter Raleigh sent two expeditions to the coast of North Carolina and attempted to form settlements on Roanoke island. A Spanish settlement was made at St. Augustine, Fla., in 1565; Jamestown, Va., was settled in 1607; New York, then called New Netherlands, in 1613; Plymouth, Mass., in 1620. A large part of the country on the Great Lakes and on the Mississippi was explored by La Salle in 1682; and settlements were made by the French.

The first effort at a union of colonies was in 1643, when the settlements in Massachusetts, New Hampshire, Rhode Island, and Connecticut formed a confederacy for mutual defense against the French, Dutch, and Indians under the title of "The United Colonies of New England." In 1761 the enforcement of the Navigation Act against illegal traders, by general search warrants, caused a strong excitement against the English Government, especially in Boston. The British admiralty enforced the law; and many vessels were seized, and the colonial trade with the West Indies was annihilated. In 1765 the passing of an act of Parliament for collecting a colonial revenue by stamps caused general indignation, and led to riots. Patrick Henry, in the Virginia Assembly, denied the right of Parliament to tax America, and eloquently asserted the dogma, "No taxation without representation." The first impulse was to unite against a common danger; and the first Colonial Congress of 29 delegates, representing nine colonies, made a statement of grievances and a declaration of rights. In 1766 the Stamp Act was repealed, but the principle of colonial taxation was not abandoned. In 1773 the duties were repealed, excepting 3d. a pound on tea.

It was now a question of principle, and from N. to S. it was determined that this tax should not be paid. Some cargoes were stored in damp warehouses and spoiled; some sent back, and in Boston a

mob disguised as Indians threw it into the harbor. England then determined to enforce the Government of the crown and Parliament over the colonies, and a fleet with 10,000 troops was sent to America, which led to the battle of Lexington, and the beginning of the Revolutionary War, April 19, 1775. The news that the British troops had been compelled to beat a hasty retreat summoned 20,000 men to the vicinity of Boston. A Congress of the colonies assembled at Philadelphia, and appointed George Washington Commander-in-Chief of an army of 20,000 men. The battle of Bunker Hill was fought at Charlestown, June 17, 1775, between 1,500 Americans, who had hastily intrenched themselves, and 2,000 British soldiers. When the Americans had exhausted their ammunition they were ordered to retreat; but as they had only lost 115 killed, 305 wounded, and 32 prisoners, while the loss on the British side was at least 1,054, the encounter had all the moral effect of a victory. After a winter of great privations the British were compelled to evacuate Boston, carrying away in their fleet to Halifax 1,500 loyal families. An army of 55,000 men, including 17,000 German mercenaries (Hessians), was sent under the command of Sir William Howe to put down this "wicked rebellion."

On June 7, 1776, Richard Henry Lee, of Virginia, offered a resolution in Congress, declaring that the united colonies are, and ought to be, free and independent States; that they are absolved from all allegiance to the British crown; and that all political connection between them and the state of Great Britain is, and ought to be, totally dissolved. This resolution was adopted by the votes of 9 out of 13 colonies, and brought about the celebrated "Declaration of Independence," which on July 4, 1776, received the assent of the delegates of the colonies. They adopted the general title of the "United States of America," with a population of about 2,500,000. From the battle of Lexington, April 19, 1775, to the surrender of Yorktown, Oct. 19, 1781, in 24 engagements, including the surrender of two armies, the British losses in the field were not less than 25,000 men, while those of the Americans were about 8,000.

After the peace, concluded Sept. 3, 1783, the independence of the United States was acknowledged by foreign powers, and in 1787 the present Constitution was ratified. George Washington and John Adams, standing at the head of the Federalist party, were elected President and Vice-President of the United States. The War of 1812 grew out of the fact that England declined to put a stop to the abuse of impressing American citizens into the British navy, the attention of Congress having been called to 6,000 instances in 1811. In 1814 the Federalists of New England held a convention at Hartford in opposition to the war and the administration of President Madison, and threatened a secession of the New England States, as having to defend themselves as it was. The war was terminated by the treaty of Ghent, Dec. 24, 1814, though the English suffered a disastrous defeat at New Orleans, Jan. 8, 1815, nearly a month after peace had been concluded between England and America.

At the period of the Revolution slavery existed in all the States except Massachusetts, but it had gradually been abolished in the Northern and Middle States, except Delaware, and excluded from the new States between the Ohio and the Mississippi rivers by the terms on which the territory had been surrendered by Virginia to the Union. The two sections had already entered on a struggle to maintain the balance of power against each other. After an exciting contest in 1820 Missouri was admitted with a resolution (the "Missouri Compromise") that in future no slave State should exist N. of the parallel of lat. 36° 30′ N. In 1826 two of the founders of the republic, John Adams and Thomas Jefferson, died on July 4, the anniversary of the Declaration of Independence. In 1732 an Indian war, called the Black Hawk War, broke out in Wisconsin; but the passing of a high protective tariff act by Congress caused a more serious trouble. The State of South Carolina declared the act unconstitutional.

A collision seemed imminent, when the affair was settled by a compromise bill, introduced by Henry Clay, providing for a gradual reduction of duties till 1843, when they should not exceed 20 per cent., ad valorem. In 1835 the Seminole War broke out in Florida, and a tribe of Indians, insignificant in numbers, under the crafty leadership of Osceola, kept up hostilities for years at a cost to the United States of several thousand men, and some $50,000,000.

In 1837 Martin Van Buren succeeded General Jackson in the presidency. His term was a stormy one, from the great financial crisis of 1837, which followed a period of currency expansion and wild speculation. All the banks suspended payment, and the great commercial cities threatened insurrection. In 1840 Gen. William H. Harrison was elected President, but died in 1841, a month after his

inauguration. He was succeeded by John Tyler, during whose administration the N. E. boundary question, which nearly occasioned a war with England, was settled by Daniel Webster, Secretary of State, and Lord Ashburton. In 1845 Texas was formally annexed to the United States, and James K. Polk, of Tennessee, succeeded Mr. Tyler in the presidency. M. Almonte, the Mexican minister at Washington, protested against the annexation of Texas as an act of warlike aggression, which brought about the Mexican War in 1846.

In 1847 the Mexicans were defeated by General Taylor at Buena Vista; Vera Cruz was taken by storm, and General Scott won the great battle of Cerro Gordo. In 1848 peace was signed, and by the treaty of Guadaloupe the United States obtained the cession of New Mexico and Upper California, the United States paying Mexico $15,000,000, and assuming the payment of the claims of American citizens against Mexico. In 1849 General Taylor, the "Rough and Ready" victor of Buena Vista, became President, with Millard Fillmore as Vice-President. In September of the same year California adopted a constitution which prohibited slavery. The election of Franklin Pierce in 1852 against General Scott was a triumph of the Democratic States' Rights and Southern party. A brutal assault on Charles Sumner, United States Senator from Massachusetts, by Preston Brooks, in consequence of a violent speech on Southern men and institutions, increased the excitement of both sections. In 1856 the Republicans, composed of the Northern Free-soil and Abolition parties, nominated John C. Fremont for the presidency, but James Buchanan, the Democratic candidate, received the election, with John C. Breckenridge as Vice-President. In Oct., 1859, John Brown, known in Kansas as "Ossawatomie Brown," who planned and led an expedition for freeing the negroes in Virginia, was captured, and executed Dec. 2, by the authorities of Virginia.

In 1860 the Southern delegates withdrew from the convention at Charleston, and two Democratic candidates were nominated, Stephen A. Douglas and John C. Breckinridge. The Republicans nominated Abraham Lincoln, and at the election of November, 1860, Mr. Lincoln received every Northern vote in the electoral college, except three of New Jersey, 180 votes. The South lost no time in acting on what her statesmen had declared would be the signal of their withdrawal from the Union. Four years of civil war ended in their being compelled to remain in it. In 1864 Mr. Lincoln was re-elected, and on March 4, 1865, commenced his second term, with Andrew Johnson as Vice-President. On April 14, 1865, while the North was rejoicing over the capture of Richmond and the surrender of the Confederate armies, the President was assassinated at a theater in Washington by John Wilkes Booth. The assassin was pursued and killed, and several of his accomplices were tried and executed. Andrew Johnson became President. Jefferson Davis, President of the Confederacy, fled after the surrender of Richmond; he was captured in Georgia, and released without trial in 1867.

An amendment to the Constitution, forever abolishing slavery in the States and Territories of the Union, was declared ratified by two-thirds of the States, Dec. 18, 1865. The vast change in the organization of the republic made by this new fundamental law was completed by the 14th and 15th Amendments, passed in 1868 and 1870, which gave to the former slaves all the rights and privileges of citizenship. The seceded States were readmitted to the Union on condition of their adhesion to the Constitution as thus amended. Owing to the reconstruction policy after the Civil War differences arose between President Johnson and the Republican leaders in both houses of Congress. This antagonism finally led to the resolution of the House of Representatives, passed Feb. 24, 1868, to impeach the President "of high crimes and misdemeanors." President Johnson, however, was acquitted, as the prosecution lacked one vote of the two-thirds vote necessary for conviction. Gen. Ulysses S. Grant was elected President in 1868, and inaugurated March 4, 1869, with Schuyler Colfax as Vice-President. He was re-elected, in 1872, with Henry Wilson as Vice-President. The Geneva Court of Arbitration gave its decree in the "Alabama" controversy in favor of the United States in 1872, while the San Juan Boundary dispute with Great Britain was settled in favor of the United States by the Emperor of Germany in the same year. The outrages of a secret organization known as the Ku-Klux-Klan, in the Southern States, necessitated the passing of an act in 1871 giving cognizance of such offenses to the United States courts.

The year 1876, memorable in the annals of the republic as the 100th anniversary of the Declaration of Independence, was celebrated by a great Centennial Exhibition at Philadelphia. The presidential election of the same year was so closely contested that Congress appointed a special tribunal, selected from the Senate, the House of Representatives, and the justices of the Supreme Court, to examine the election returns. The de-

cision was in favor of Rutherford B. Hayes, the Republican candidate, who was declared to have been elected President, and inaugurated March 5, 1877. In 1879 specie payments were resumed throughout the United States, after a suspension of 17 years. In 1880 the Republican National Convention at Chicago nominated Gen. James A. Garfield, of Ohio, and Chester A. Arthur, of New York, for President and Vice-President. The Democratic National Convention was held in Cincinnati, O., and Gen. Winfield S. Hancock and William H. English, of Indiana, were selected as candidates. The result of the election was in favor of the Republicans. General Garfield was inaugurated, March 4, 1881. On July 2, 1881, he was shot by a disappointed office seeker, Charles J. Guiteau, and after more than two months of suffering died from the effects of the wound at Elberon, N. J., Sept. 19, 1881. His loss was lamented by the whole nation. He was succeeded by Vice-President Chester A. Arthur, who served the remainder of the term.

In 1884 the Democratic party nominated Grover Cleveland and Thomas A. Hendricks for the presidency and vice-presidency, while the Republicans put up James G. Blaine and John A. Logan. The election resulted in the choice of Grover Cleveland and Thomas A. Hendricks, who were inaugurated March 4, 1885. The death of General Grant on July 23, 1885, was a notable event, and one that profoundly moved the whole nation. Mr. Hendricks died Nov. 25, 1885, and John Sherman, by virtue of his election as president *pro tem.* of the Senate, became his successor. Mr. Cleveland's administration was in the main uneventful, though the country was disturbed by widespread and obstinate conflicts between labor and capital. The silver coinage question, the reform of the civil service, the Mormon question, the labor problem, and the Pan-Electric controversy were the issues of the hour. The presidential campaign of 1888 had the tariff question for its main issue. Mr. Cleveland was renominated by the Democracy, with Allan G. Thurman for Vice-President, and Benjamin Harrison, of Indiana, grandson of the ninth President of the United States, and Levi P. Morton, for Vice-President, were nominated by the Republicans. The latter were elected, the electoral vote standing 233 to 168. In 1889 four new States were added to the Union, namely, Montana, North Dakota, South Dakota, and Washtington, and the Territory of Oklahoma was carved out of the Indian Territory. In 1890 Wyoming and Idaho were admitted to statehood.

In 1892 Mr. Harrison was renominated by the Republicans for President, and Whitelaw Reid, of New York, for Vice-President. The Democrats nominated Mr. Cleveland for President, and Adlai E. Stevenson, of Illinois, for Vice-President. Cleveland and Stevenson were elected by an electoral vote of 277 for the ticket, against 145 for Harrison and Reid, and 22 for Weaver, the candidate of the People's party. The year 1893 was memorable for the monetary depression and hard times throughout the United States, and, to some extent, all over the world. Many thousands of men were out of employment; many financial institutions and business enterprises failed. Almost every form of security depreciated. A great railway strike, accompanied by great destruction of property and some loss of life, occurred on roads centering in Chicago; and others of less magnitude elsewhere. An army of unemployed men made a demonstration by marching across the country, subsisting on popular charity as they went, to the city of Washington, where they hoped to influence legislation by Congress, and action by the executive, to relieve the unemployed. This condition of things was popularly attributed to the administration, and to the Democratic tariff bill that had not yet been substituted for the McKinley bill, but was sure to be passed. As a consequence, in the State and Congressional elections of 1894 the Republicans obtained sweeping victories, and came into power in Congress. The administration was otherwise marked by its maintenance of friendly relations with Spain against the belligerent urgency of a large anti-Spanish party, friendly to Cuban independence; by the extension of the Civil Service; and by the Arbitration Treaty of 1897.

The presidential campaign of 1896 was an unusually exciting one, with seven tickets in the field: Republican, William McKinley and Garret A. Hobart; Democratic, William J. Bryan and Arthur Sewall; People's, William J. Bryan and Thomas E. Watson; Prohibition; Joshua Levering and Hale Johnson; National Democratic, John M. Palmer and Simon B. Buckner; Social Labor, Charles H. Matchett and Matthew Maguire; and National (Free-Silver Prohibition), Charles E. Bentley and James H. Southgate. In the election the Republican candidates received 7,104,779 popular and 271 electoral votes, and the fused Democratic and Peoples' candidates 6,502,925 popular and 176 electoral votes. This campaign was characterized by a remarkable revolt in the Democratic party and a fusion of that party with the Populist. See BRYAN,

WILLIAM JENNINGS; MCKINLEY, WILLIAM.

The great event of this administration was the war successfully waged by the United States against Spain in 1898; the freeing of Cuba from Spanish dominion; the acquisition by the United States, as a result of the war, of Porto Rico, the Philippine Islands, and Guam, and, by treaty, of Hawaii and the Samoan island of Tutuila; and the formation of a considerable party, known as Anti-Expansionists and Anti-Imperialists. The details of the war are given under CUBA; MANILA BAY; PHILIPPINE ISLANDS; PORTO RICO; SANTIAGO; SPANISH-AMERICAN WAR; and the various names of persons and places that became prominent in the war.

In the presidential campaign of 1900 there were eight tickets in the field: Republican, William McKinley and Theodore Roosevelt; Democratic, William J. Bryan and Adlai E. Stevenson; Prohibition, John G. Woolley and Henry B. Metcalf; Middle-of-the-Road or Anti-Fusion Peoples', Wharton Barker and Ignatius Donnelly; Social Democratic, Eugene V. Debs and Job Harriman; Social Labor, Joseph F. Malloney and Valentine Remmel; United Christian, J. F. R. Leonard and John G. Woolley; and Union Reform, Seth H. Ellis and Samuel T. Nicholas. The election gave the Republican candidates 7,208,224 popular and 292 electoral votes, and the Democratic candidates, 6,358,789 popular and 155 electoral votes. On Sept. 6, 1901, while attending the Pan-American Exposition in Buffalo, N. Y., President McKinley was shot twice by Leon Czolgosz, an anarchist, and died from his injuries on the 14th. Immediately thereafter Vice-President Roosevelt took the oath of office as President. In February-March, 1902, Prince Henry of Prussia, brother of the Emperor of Germany and an admiral in the German navy, visited the United States. In 1904 the Republican ticket, led by President McKinley's Vice-President, Mr. Roosevelt, was triumphantly elected with a popular majority of 2,500,000.

The administration of President Roosevelt was marked by the passage of many important measures through Congress. The Federal Government, under the guidance of the President, was especially active against combinations in restraint of trade, discriminations by railroads and the payment by them of rebates to favored shippers. As the result of an investigation carried on by various Government commissions, suits were brought against the Northern Securities Co., a holding company for the Great Northern and the Northern Pacific railroads, and this combination was declared illegal and was dissolved by the Supreme Court in 1904. The beef trust was prosecuted and declared illegal in the following year. During the 59th Congress, many important measures were passed along the lines indicated above. These included a bill for the regulation of railways, a rigid meat inspection law, and a pure food bill. Other measures provided for the establishment of the Bureau of Immigration, the restriction of Japanese immigration, and the passage of the Aldrich-Vreeland Act, making provision for a monetary commission.

The great fire and earthquake in San Francisco occurred in April, 1906. In the year previous, through the good offices of President Roosevelt, the meeting of the Russian and Japanese peace commissioners, at Portsmouth, N. H., resulted in a treaty of peace between the two countries, on September 5, 1905. The United States was obliged to intervene in Cuba owing to an insurrection in that country, and a provisional government was established on September 29, 1906. A customs treaty with Santo Domingo was ratified in 1907. Threatened friction with Japan over conditions in the Orient, especially in China, was averted by an agreement between Elihu Root, Secretary of State, and the Japanese Minister. This agreement provided for the continuance of the "open door" in China, and pledged both governments to consultation before these policies should be changed.

The President's aggressive attitude in favor of reform measures brought about sharp opposition, especially in the Senate, on the part of the leaders of the conservative element. This resulted in the ignoring by Congress of many of the policies advocated by the President.

President Roosevelt had plainly indicated that he favored William H. Taft, Secretary of War, as his successor. As a result of this support and the popular approval of Taft, he was easily nominated in the Republican National Convention. The Democrats nominated William J. Bryan for president and J. W. Kern of Indiana for vice-president. In the voting, Taft was elected by a popular vote of 7,690,006 to 6,409,106 for Bryan. Taft received 321 electoral votes, with 162 for Bryan.

The first action of Congress under the administration of President Taft, was the revision of the tariff. Long consideration resulted in the passage, on August 5, 1909, of the Payne-Aldrich Law, which was approved by the President in spite of strong opposition.

A notable change in the rules of the House of Representatives was brought

about in 1910 through a coalition of Democrats and insurgent Republicans. This resulted in depriving the Speaker of some of his most important powers. During this session of Congress, the most important measures were those for the establishment of a Commerce Court, for a postal savings bank system, the Mann "White Slave" Act, and a measure providing for limitation on contributions to campaign funds.

The progressive element of the Republican party had become greatly dissatisfied with President Taft's alleged reactionary stand on important measures, and this feeling was intensified when Theodore Roosevelt returned from a trip to Africa on March 10, 1910, and expressed himself strongly dissatisfied with President Taft's administration. As a result of these conditions, the Democrats in the election of 1910, carried the House of Representatives by a majority of 66 and increased their membership in the Senate. President Taft in 1911 attempted to bring about the passage of the Reciprocity Treaty with Canada. Congress, in special session, passed the bill on July 22. It was, however, rejected by Canada. Largely as a result of a scandal in the election of senators, a constitutional amendment providing for their direct election was submitted to the people in 1912 and was ratified in 1913. In the same year the States ratified the 16th amendment to the Constitution which was submitted in 1911, granting authority to Congress to enact income tax laws. During the session of the 61st Congress, acts were passed for the government of the Panama Canal Zone, and provided for the exemption from tolls of American ships engaged in coastwise trade. An act providing for civil government of Alaska; acts providing for New Mexico and Arizona as separate States; a measure creating the Department of Commerce; and an immigration law containing a literacy test, which, however, was vetoed by the President, were also passed.

Foreign relations during these years had many important phases. The forces of occupation were withdrawn from Cuba in 1909. In the same year long-standing differences with Venezuela were peacefully settled.

In 1910 Philander C. Knox, Secretary of State, proposed to various nations the establishment of a permanent court of arbitration at The Hague. At the same time treaties of arbitration were negotiated with the principal European countries. Many of these were signed in 1911. The conditions in Mexico from 1910 to 1913 provided difficult problems for President Taft. Large forces of American soldiers were detailed to control the border during the Madero revolution and following. While the administration was opposed to intervention, it sought to protect American interests and lives. In March, 1912, an embargo was placed on the shipment of arms across the border to Mexico. President Taft declined to recognize the government of President Huerta, which succeeded that of Madero in February, 1913.

There were three prominent Republican candidates for the Presidency in 1912. These were President Taft, Theodore Roosevelt, and Senator La Follette of Wisconsin. Mr. Roosevelt did not enter the campaign until Senator La Follette was withdrawn. Preferential primaries for presidential candidates were used in many States for the first time prior to the convention. At the National Convention held in Chicago, the contested seats were decided chiefly in favor of Taft delegates. Roosevelt supporters declared the decisions wrongly made and the greater part of them declined to take part in the balloting. President Taft was recommended on the first ballot and James S. Sherman was nominated for the vice-presidency. In the Democratic party there were also several strong candidates. These included Champ Clark, the Speaker of the House; Judson Harmon, Governor of Ohio; Woodrow Wilson, Governor of New Jersey; and Oscar W. Underwood, member of Congress from Alabama. At the convention held in Baltimore, there was a strong contest between the Conservatives, led by Alton B. Parker of New York, and the Progressives, led by William J. Bryan. Forty-six ballots were required for the nomination, and Woodrow Wilson was nominated on this ballot, largely through the personal support of Bryan. Thomas R. Marshall of Indiana was nominated for the vice-presidency.

Following the nomination of President Taft, President Roosevelt left the Republican party and organized another, called the Progressive party. In August, 1912, delegates of this party met in Chicago and nominated Theodore Roosevelt for president, and Hiram W. Johnson of California for vice-president. The campaign was one of the bitterest ever waged in the history of the country. In the election on November 12, Woodrow Wilson received 6,286,214 popular votes; Theodore Roosevelt, 4,126,020; William H. Taft, 3,483,922. Thus the split in the Republican party resulted in the election of Wilson. A remarkable feature of the voting was the increase in the strength of the Socialist party. This party nearly doubled its vote in 1908. The electoral vote was 435 for Wilson,

88 for Roosevelt, and 8 for Taft. The Democrats also secured the control of the House by a large majority, and of the Senate by 7 votes.

Shortly after his inauguration, President Wilson called Congress in special session to revise the tariff. He revived the custom of Washington and Adams and delivered his message to Congress in person. A new tariff act was at once drafted and was passed on October 3, 1913. The bill, in general, greatly reduced the duties, and the loss of revenue was made up by an income tax law which was made a part of the tariff law. Congress at this session also considered the problem of currency reform. This resulted in the establishment of the Federal Reserve Bank.

Foreign relations occupied the greater part of the attention of President Wilson during 1913. The President followed President Taft's action in refusing to recognize General Huerta as president, chiefly on account of the belief that he had connived in the murder of Madero. Relations with Japan also became serious as the result of the passage by the legislature of California of laws prohibiting the ownership of land by aliens who could not be naturalized. The Japanese Government made a strong protest and William J. Bryan, Secretary of State, went to California in an effort to secure a change in the State Legislature. In this he failed. An agreement was arrived at, however, between the United States and Japan, by the terms of which Japan promised to restrict the immigration to the United States. The republic of China was recognized on May 2, 1913. Conditions in Nicaragua resulted in the establishment of a practical American protectorate in that country. On December, 1913, the President delivered a special message on the Mexican situation in which he declared that he saw no reason to "alter our policy of watchful waiting." A bill was passed by Congress providing for an emergency army of 240,000 men.

Congress passed many important measures, including the Interstate Trade Commission Bill on December 8, 1914, and the Clayton Anti-Trust Act on October 8, 1914. Largely through the efforts of the President, the Panama Canal Tolls Measure was repealed by Congress, as the result of protest made by Great Britain that its terms violated the Hay-Pauncefote Treaty.

Early in 1914 the Mexican situation grew more acute. The President lifted the embargo on the shipment of arms into Mexico, and large amounts of munitions were purchased by revolutionists against Huerta. On April 9, a number of American marines were arrested at Tampico by an officer of Huerta. Their surrender and an apology were demanded by Rear-Admiral Mayo, who also insisted on a salute of the United States flag. Huerta refused to yield to this demand, and on April 20 the President requested authority of Congress to employ the forces of the United States to exact reparation. There followed the bombardment and occupation of Vera Cruz, with a loss of 18 American marines. Americans were warned to leave Mexico. While plans were being made for actual hostilities, President Wilson accepted the offer of Argentina, Brazil and Chile to arbitrate the question at issue. The commissioners of these countries met at Niagara Falls. While they were in session, Huerta, having been defeated, resigned, and the government was relinquished to Carranza. The United States forces were withdrawn from Vera Cruz in November, 1914. A treaty was negotiated with Colombia by which the United States agreed to pay $25,000,000 to that country for the loss of Panama. This treaty was not ratified by the Senate. Eighteen peace and arbitration treaties were negotiated during this year.

United States in the World War.— The policy which was proclaimed by the United States at the outset of the World War was one of strict neutrality. For nearly three years, this attitude was officially maintained, often under circumstances of great difficulty. Both the Entente and the Central Powers, in their effort to gain a real or fancied advantage, violated the letter and spirit of international law, to the prejudice of our undoubted rights. The State Department was constantly busied with correspondence addressed to Great Britain and Germany, calling them to account for these violations, and demanding that the offending practices be abandoned. It was realized, however, that both of the warring powers were under great strain, and the diplomatic representations of this country were marked by patience and self-restraint. But from the beginning there was a difference between the injuries we suffered from the belligerents. Only property losses were incurred from the encroachments of Great Britain, as in the case of the British blockade regulations and the blacklist, while Germany's infractions of the law of nations involved the loss of American lives. Financial losses could have been made good at the end of the war; the loss of life was irreparable.

Apart from these direct grievances, the tide of popular feeling ran strongly against Germany, because of the viola-

tion of Belgian neutrality and the atrocities that marked her conduct of the war. This sentiment was heightened by the propaganda that had its center in the German Embassy at Washington and the ever increasing obstruction, arson and outrage in American plants, in the effort to hinder supplies from being shipped overseas. Moreover the utterances of responsible German statesmen as to German aims in the war created the impression that she was seeking the hegemony not only of Europe and Asia but of the world, and that if successful in Europe, the United States might be the next object of attack. It began to be felt that the cause of the Entente was the cause of freedom and of civilization.

That impression became a conviction, when the news came of the sinking of the "Lusitania," May 7, 1915. The details of that tragedy are narrated elsewhere (see LUSITANIA) and need only the barest mention here. This great ocean liner was torpedoed without warning off the Old Head of Kinsale on her journey from New York to Liverpool. She carried 1,257 passengers and a crew of 702. She sank in twenty-three minutes, carrying down 1,150, of whom 124 were Americans, including many women and children.

The nation was stunned by the shock. Then came a tremendous outburst of rage and grief, and for a while the country was perilously near the verge of war. It was not the first time that American lives had been lost through submarine operations. One American citizen had perished when the British liner, "Falaba," had been torpedoed and sunk March 28, 1914, off Milford, England. Two others had been killed when the American ship "Gulflight" was attacked off the Scilly Islands, May 1, 1915. These casualties, however, had been explained by the German Government as due to a mistake in the "Gulflight" case, while the "Falaba", it was charged, had tried to escape after having been summoned to stop. Reparation had been promised for the attack on the former. These instances had aroused American indignation, but the feeling occasioned by them was nothing compared to the horror evoked by the wholesale massacre of the "Lusitania's" passengers and crew.

A series of three notes was despatched to the German Government, the first bearing the date of May 13, 1915, declaring that the United States Government expected disavowal, reparation and immediate measures to prevent the repetition of the outrage. The reply of the German Foreign Secretary, Von Jagow, dated May 28, declared that the "Lusitania" was an auxiliary cruiser, that it had guns concealed beneath its decks, that it was transporting Canadian troops and munitions of war, and that the rapidity with which it sank was due to the explosion of the munitions carried. Further correspondence was invited. A second American note, despatched June 9, denied that the Lusitania had carried troops or was armed for offense, and asserted that "whatever be the other facts regarding the 'Lusitania,' the principal fact is that a great steamer, primarily and chiefly a conveyance for passengers and carrying more than a thousand souls that had no part or lot in the conduct of the war was torpedoed and sunk without so much as a challenge or a warning, and that men, women and children were sent to their death in circumstances unparalleled in modern warfare." The note called upon the German Government to adopt such principles in its submarine warfare as should safeguard American lives and American ships. The answer to this note was evasive and unsatisfactory. It elicited from the American Government a third and sharper note, which concluded with the phrase that "repetition by the commanders of German naval vessels of acts in contravention of American rights must be regarded by the Government of the United States as deliberately unfriendly." The last phrase was a diplomatic way of saying that war would follow.

Pending the interchange of these notes, the German Ambassador, Von Bernstorff, had offered on behalf of his Government to cease submarine warfare, provided that the United States secured certain concessions for Germany from England and should guarantee that vessels coming from American ports should carry no contraband of war. The United States Government refused thus to purchase immunity for its citizens.

The correspondence secured no satisfaction for the "Lusitania" massacre, and even during its continuance, similar attacks were made on the "Nebraskan," May 25, the "Orduna," July 9, while on Aug. 19, two American citizens were drowned in the sinking of the British steamer "Arabic." On Sept. 1, 1915, however, Count von Bernstorff informed Secretary Lansing that passenger liners would not thenceforth be sunk by German submarines without warning and without taking measures to assure the safety of non-combatants, on condition that the steamers would not try to escape or offer resistance. A message of the same tenor was received from Von Jagow on Sept. 21. On Oct. 5, the sinking of the "Arabic" was disavowed by Von Berstorff in the name of his

Government, which expressed regret, promised indemnity, and declared that orders had been issued to submarines that were so rigorous that the recurrence of such incidents was considered impossible.

The protests of the United States against lawless submarine attacks were not confined to Germany alone. The Italian liner "Ancona" was destroyed by an Austrian submarine in the Mediterranean Sea, Nov. 7, 1915. Of 507 persons on board, 308 were lost, of whom 9 were Americans. The submarine shelled the helpless passengers, as they were trying to get away in the lifeboats. Correspondence ensued with the Austrian Government, which finally, on Dec. 29, announced that the commander of the submarine had been punished, and promised, with some reservations, to indemnify the families of the victims.

Another item in the account with Austria was an attack by an Austrian submarine, Dec. 5, 1915, on the American oil steamer "Petrolite," off the coast of Tripoli. A sailor was wounded, and the submarine still kept on firing, even after the "Petrolite" had swung broadside to, so that the submarine commander could see her name printed on her side and the American flag flying at her mast. Stores were also taken from the vessel before she was allowed to proceed. Representations made by this Government were met by a flat denial of the facts. An attack was made on the British passenger liner "Persia" by a submarine in the Mediterranean southeast of Crete, Dec. 30, 1915. 335 lives were lost, including two Americans, of whom one was an American consul on his way to his post at Aden. The wake of the torpedo that destroyed the ship was clearly seen, but as the submarine itself was not visible, Germany, Austria, and Turkey denied responsibility.

The winter of 1915-1916 was comparatively quiet, but with the coming of spring there was a revival of submarine outrages. March 1, 1916, the French liner "Patria" with Americans on board was attacked without warning, but escaped. On March 9, a Norwegian ship, the "Silius" was sunk in Havre Roads, and one American in the crew was injured. The Dutch steamer "Tubantia" was torpedoed on the night of March 15, 1916, in the North Sea. Americans were on board but were saved. On March 18, the "Berwindvale" with four Americans on board was torpedoed off Bantry, Ireland, but no lives were lost.

A wanton attack, and one that provoked a new crisis, was that on the French Channel steamer "Sussex" on its way from Folkestone to Dieppe, March 24, 1916. Eighty passengers, including some Americans were killed or wounded. This flagrant case brought this country to the very edge of hostilities. The German authorities declared that the "Sussex" must have struck a British mine. It was admitted that a long, black steamer was torpedoed in the Channel by one of their submarines, but it was declared that it was a British warship or mine layer. Irrefutable proofs were furnished by this Government of the falsity of these statements. On April 18, Secretary Lansing despatched a note to the German Government, which expressed regret that that Government did not understand the gravity of the situation resulting not only from the "Sussex" attack, but from the whole German method of submarine warfare. The note recalled Germany's promise to respect passenger ships, and asserted that the commanders of her submarines had violated that promise, with the result that the list of Americans who had thus lost their lives had been steadily lengthening until it had now reached 100. The patience of the United States Government was adverted to, and the note went on to say that it had now "become painfully evident that the position that the American Government took at the very outset had been justified, namely, that the use of submarines for the destruction of an enemy's commerce was, of necessity, because of the very character of the vessels employed and the very methods of attack which their employment of course involved, utterly incompatible with the principles of humanity, the long-established and incontrovertible rights of neutrals and the sacred immunities of non-combatants." At the end of the note, Germany is warned that if it was still her purpose to persist in prosecuting relentless and indiscriminate warfare, the American Government would have no choice but to sever diplomatic relations.

The German reply, though delayed until May 4, showed that the Imperial Government was beginning to recognize that American patience had nearly reached the breaking point. It still protested that many of the offenses charged against her commanders were due to mistakes, such as occurred in all wars, and it was also contended that the German submarine warfare was only a response to British violations of international law that virtually condemned millions of women and children to starvation. But a pregnant concession was made in the following announcement: "German naval forces have received

this order: In accordance with the general principles of visit and search and the destruction of vessels recognized by international law, such vessels, both within and without the area declared a naval war zone, shall not be sunk without warning and without saving human lives, unless the ship attempt to escape or offer resistance." A loophole for escape from this categorical promise was left, however, in the expression of hope that the United States Government would forthwith secure from the British Government a stricter observance of the rules of international law and the statement that "should steps taken by the United States not obtain the object it deserves, to have the laws of humanity followed by all the belligerent nations, the German Government would then be facing a new situation, in which it must reserve to itself complete liberty of decision."

In its reply, taking cognizance of the German promise, the United States Government was careful to disclaim any obligation to offer a quid pro quo for the concession. "In order to avoid any possible misunderstanding," the note declares, "the Government of the United States notifies the Imperial Government that it cannot for a moment entertain, much less discuss, a suggestion that respect by German naval authorities for the rights of citizens of the United States upon the high seas should in any way or in the slightest degree be made contingent upon the conduct of any other Government affecting the rights of neutrals and non-combatants. Responsibility in such matters is single, not joint; absolute, not relative."

For a time after this promise was given, it was generally respected, and it began to seem as if actual participation by America in the war might be avoided. Although from British sources came the statement that by Oct. 1, 15 vessels had been sunk without the warning that Germany had explicitly promised to give, the American State Department had no satisfactory evidence to support the statement.

On July 9, 1916, the German submarine "Deutschland," a commercial vessel entered the port of Norfolk and proceeded to Baltimore. No attempt was made by this Government to discriminate between it and any other commercial ship in the matter of port facilities. This led to a remonstrance on the part of the Allied nations, directed to all neutral nations, but primarily directed at the United States with the "Deutschland" incident in view. The Entente view was that the peculiar characteristics of submarines are such that they ought not to be allowed the same port privileges as other merchant vessels. Among these characteristics were the ability to dive, by which they could avoid control and identification, so that their character as neutral or belligerent, as naval or merchant vessel, could not be ascertained. The United States, however, refused to accept this reasoning as a rule of action.

Much less peaceful was the visit of the German war submarine, the "U-53," which unannounced entered Newport harbor, Oct. 7, 1916, and after delivering mail for the German Embassy, departed after a few hours' stay. Within the next two days, the "U-53" had sunk in swift succession one Dutch, one Norwegian and three British ships, within sight of the American coast. Legal warning was given in each case, and the crews permitted to escape, some of the latter being picked up by American destroyers in the vicinity. The bringing of the submarine war to this side of the ocean created considerable excitement, and the question was raised whether the action of the submarine did not constitute a blockade of the American coast and an infringement upon American rights. The matter, however, was permitted to stay in abeyance.

On Oct. 30 the British ship "Marina" was torpedoed while on her way to this country and six Americans of fifty who were on board were killed. Then came an attack upon the American steamer "Chemung" and that on the steamer "Russian" with a loss of 17 American lives. No adequate explanation was forthcoming.

While the two countries were by these occurrences being brought nearer the brink of war, efforts were being made by the President of the United States to find some common grounds on which peace might be secured, or negotiations at least opened, between the Entente and the Central Powers. The occasion was offered by the German announcement on Dec. 12, 1916, that the Imperial Government was ready to enter into peace negotiations. The terms were couched, however, so much in the spirit of a victor magnanimously offering peace to the vanquished that they were emphatically, almost curtly, refused by all the Allied nations. Despite this refusal, the time (Dec. 18), seemed auspicious for the President of the greatest of the neutrals to act as mediator, although he stated that the plan had been conceived long before the issuance of Germany's offer. What the President sought to obtain was a concrete statement of terms, on which negotiations might be initiated.

The crux of his note was contained in the passage: "The leaders of the several belligerents have stated those objects (i. e. of the war), in general terms. But stated in general terms, they seem the same on both sides. Never yet have the authoritative spokesmen on either side avowed the precise objects which would, if attained, satisfy them and their people that the war had been fought out. The world has been left to conjecture what definite results, what actual guarantees, what political or territorial changes or readjustments, what stage of military success even, would bring the war to an end."

The President's views found an echo in the United States Senate, which passed a resolution approving it. The note also created a profound sensation in the nations at war. By the peoples of the Central Powers it was in the main approved, largely because of the favorable military situation in which at the moment they found themselves. By the Allies, however, much of whose territory was occupied by German forces, the note was received without enthusiasm and in some quarters with thinly veiled resentment. The Allies, however, seized the occasion to present to the world a detailed statement of the principal aims they had in view in the war they were waging. Those aims are narrated in full in another place (see WORLD WAR). To this statement, the German Government made rejoinder on Jan. 11, in a note which scouted the demands of the Entente, declared that Germany had made a sincere attempt to open negotiations for peace and placed all blame for the war's continuance upon the shoulders of their enemies. The net result of the President's effort was nil.

A significant episode in connection with the speech was a statement issued by Secretary Lansing on Dec. 20, two days later. He stated that the note had been prompted by the fact that "we ourselves are drawing nearer the verge of war." This official statement created great alarm, so great indeed that the Secretary felt impelled later in the same day to explain away the indiscreet utterance. His efforts were only effectual in part, however, and uneasiness persisted. It was felt that more was going on behind the veil of diplomatic exchanges than had hitherto been suspected.

Undeterred by the failure of his first effort, the President again, on Jan. 22, took upon himself the rôle of mediator. This time it was in the form of an address before the Senate. The avowed object of the speech was to specify the conditions under which the United States might conceivably join a league to enforce peace throughout the world, but the real reason for its delivery was to bring the conflict then in being to an end. The effect of the speech, which in the main was admirable in spirit and form, was measurably diminished by the phrase "peace without victory," which aroused keen resentment among the Allied nations and met with marked disapproval on the part of a large body of influential opinion in America.

At this juncture came the announcement of Germany's determination to embark on ruthless submarine warfare—a most momentous announcement that spelled the doom of the German cause. It burst upon the neutral world with stunning effect. On Jan. 31, 1917, Von Bernstorff handed the text of the German note on submarine warfare to the American Secretary of State. At the same time an identical note was delivered to all the neutral governments. It stated that beginning on the following day, Feb. 1, all merchant ships bound to or from allied ports, found in a prohibited zone, would be sunk without warning. This revoked the promise that had been made to the United States in the "Sussex" case. The prohibited zone included the waters bordering France, England and Holland, and certain sections of the Mediterranean. The one exception allowed to the United States was that once a week she could despatch a ship to Falmouth, England, and have one sail from Falmouth to the United States, provided that the ship bore certain markings, followed a specified route and carried no contraband. The justification for the step was given in the statement that since the attempt to come to an understanding with the Entente Powers had been answered by them by the announcement of an intensified continuation of the war, the Imperial Government was compelled to continue the struggle for existence by the full employment of all weapons that lay in its power.

At the same hour that the note was handed to the neutral powers, the German Chancellor, Von Bethmann-Hollweg, in the Reichstag, amplified the substance of the note, explaining why he had previously opposed ruthless submarine war and the steps by which he in common with the German military authorities had come to determine upon its prosecution, and declared in conclusion that "in now deciding to employ the best and sharpest weapon, we are guided solely by a sober consideration of all the circumstances that come into

question, and by a firm determination to help our people out of the distress and disgrace which our enemies contemplate for them."

The sensation produced by this determination was prodigious. It deepened the conviction that when the Secretary of State had let slip the statement, previously referred to, about this country's being "near the verge of war," he must have had some intimation, either from Ambassador Gerard in Berlin or from the chancelleries of the Allied nations, that ruthless warfare was contemplated. For some days following the delivery of the submarine note, the country was in a fever of excitement. No intimation was given as to what the President would do, although it was known, on Feb. 2, that he had reached a decision of some kind. On that date, he conferred with the Cabinet, and late in the afternoon consulted with a number of senators at the Capitol. Early on Feb. 3, he announced that he would on that day address both houses of Congress. Before he made the address, however, he informed Secretary of State Lansing that he had determined to break off diplomatic relations with Germany. At two o'clock that afternoon, he appeared before the joint gathering of Congress. Floors and galleries were packed with members and spectators, in a tense attitude of repressed excitement and expectation. The address lasted half an hour, and was listened to with the most profound attention.

The President reviewed the details of the "Sussex" case that had ended with the assurance of the German Government that it would not henceforth sink merchant ships without warning and without taking precautions for the safety of their passengers and crews. He recalled that this Government had threatened to break off diplomatic relations unless such promise should be given. That promise had now been broken, and the only course left that was consistent with the honor and dignity of the United States was to make good its threat. The President had therefore directed the Secretary of State to announce to the German Ambassador that all diplomatic relations between the two Governments were severed, to hand him his passports, and at the same time to recall the American Ambassador from Berlin.

In concluding, the President expressed the hope that, despite Germany's declaration, she would not actually embark upon ruthless submarine warfare, and stated that only actual overt acts on her part would make him believe it. If, however, this hope should prove unfounded, and if American ships and American lives should be destroyed by such acts on the part of her submarine commanders, in contravention of international law and the dictates of humanity, the President stated that he would again take the liberty of coming before Congress to ask of it authority to take whatever measures might be necessary to protect our seamen and our people in the prosecution of their legitimate errands on the high seas.

The speech received the immediate and hearty indorsement of the American people, regardless of party. It was felt that no other course could possibly be followed without the loss of national self-respect. There was no delusion as to what was implied in the breaking off of diplomatic relations. Almost invariably in modern times, such an act had been the prelude to war, and in the state of popular feeling there was little reason to think that this would prove an exception. But as between war and national degradation the nation had decided on its course.

Now that the decision had been actually reached there was no delaying or hesitation. In fact, at the precise moment that the President began his address, the German Ambassador received his passports from Secretary Lansing. Steps were instantly taken to receive a guarantee of safe conduct out of the country, and this was granted by Great Britain and France within forty-eight hours. The Scandinavian-American liner, "Frederick VIII.," was placed at his disposal; and on this vessel, accompanied by his suite and many German consuls and propagandists, he left the port of New York, Feb. 14, 1917.

It was a regrettable fact that similar courtesy was not extended to Ambassador Gerard at Berlin. In defiance of all the amenities that usually attend such departures, he was kept in the German capital for an indefensible length of time by something closely resembling force.

The official instructions from the United States Government did not reach Ambassador Gerard until Feb. 5, and immediately upon their receipt he asked the German Foreign Office for his passports. At the same time, he committed American interests to the legations of Spain and Holland. But although he was promised his passports they were not forthcoming, and he was subjected to a host of annoyances. His mail was withheld, his telephone service cut off and his telegrams were not sent. He was unable to communicate with United States consuls in Germany, and in fact, if not in name, was a prisoner, kept

under constant surveillance. During this period, repeated attempts were made by the German authorities to secure a reaffirmation of the old treaty between the United States and Prussia, whose terms, it was thought, would safeguard the German ships in American ports. This, however, was emphatically refused by Mr. Gerard, as it was later by the American Government, when overtures were made to it directly. The Ambassador finally succeeded in leaving the German capital on Feb. 10, and reached the Swiss frontier the following afternoon.

While the German Government had contemplated the possibility of diplomatic relations being severed with America, as the result of its pronouncement regarding ruthless warfare, there was no doubt that it had cherished hope that such a step would not be taken. On Feb. 12, Secretary Lansing gave out a memorandum that had been presented to him by Dr. Paul Ritter, the Swiss Minister to this country, in whose care Von Bernstorff had left German interests. The memorandum intimated that the submarine order might be modified in favor of the United States, providing that the commercial blockade against England were not thereby affected. The American Government refused to discuss the matter, unless and until the German Government renewed the assurance given in the Sussex case, and acted upon that assurance. Chagrined at its failure, the German Government reiterated that unrestricted war against all vessels in the barred zones was under full swing and would under no circumstances be abandoned.

Coincident with the breaking off of diplomatic relations, was the extensive sabotage carried out by the crews of German ships interned in the harbors of this country. There were 91 of such ships, totaling 594,696 gross tons. Of these, 31 were in New York harbor, their value estimated at $29,000,000. During the three days from Jan. 31, to Feb. 2, parts of the engines of the ships were either destroyed or removed, so that in the event of their seizure by this Government they would be unavailable for cargo or passenger purposes for months. The precision and thoroughness with which this work was done indicated that it was the result of orders from the German Embassy or Government. Under international law, this could not be prevented, as long as war had not been declared, and the captains and crews were left in undisturbed possession of their vessels, the Government contenting itself with the establishment of armed guards on the piers at which the ships were moored, to prevent any attempt that might be made to sink them and thus obstruct navigation.

Other military precautions were taken. The public were forbidden access to navy yards and government buildings. Arsenals, bridges, subway entrances, aqueducts, reservoirs and government plants were placed under strict guard. The Panama Canal was carefully watched. The erection of a new fort was begun at Rockaway Point, in order to strengthen the defense of New York harbor. Legislative action was also taken looking toward preparedness. The House, on Feb. 12, passed the largest Naval Appropriation bill in the history of the nation, carrying over $368,000,000. The President was authorized to commandeer shipyards and munition plants in case of war or national emergency.

Almost immediately after the diplomatic break with Germany, the United States Government addressed a note to the other neutral nations, advising them of the act and the reasons that prompted it, and expressing the hope that they would see their way clear to taking similar action. None, however, went that far, though protests varying in force were sent by all of them to Germany.

Ruthless submarine warfare had been carried on with vigor for nearly four weeks, when, on Feb. 26, President Wilson addressed a joint session of Congress, and asked that he be given authority to supply guns and ammunition to American merchant ships, and employ any other instrumentalities that might be necessary to protect American citizens and interests on the high seas. He cited two recent cases in which American ships, the "Housatonic" and the "Lyman M. Law," had been sunk, and pointed out that the submarines were acting as an embargo on American trade. Even while he was proceeding to the Capitol to deliver his address, news came of another sinking to be added to the list, that of the Cunard liner "Laconia," in which American lives were lost. Immediately after the President's appeal, a bill was introduced in the House embodying most of his suggestions and, after a debate in which partisanship played no part, was passed, March 1. In the Senate, however, the bill failed to pass, although an overwhelming majority was in favor of it. A determined filibuster was organized by a small group, who, under the rules of the Senate, were able to prolong debate until the bill died automatically at the ending of the session on March 4.

The President appealed to the country, and the almost overwhelming response convinced him of the depth of the indignation that had been aroused by the action of the recalcitrant group of senators. On March 9, he issued a proclamation calling Congress to meet in special session on April 16. No purpose was specified, though it was intimated that the President wanted the support of Congress in any action he might find necessary to take for the public defense. At the same time a statement was issued from the White House that the President was convinced of his right to direct the arming of merchant ships by Presidential proclamation. This he did on March 12. On that date all members of the diplomatic corps in Washington were informed by Secretary Lansing that, in view of the course of the German Government in sinking ships without warning, the Government of the United States had determined to place upon all American merchant vessels, whose course lay through the barred zone, armed guards for the protection of vessels and lives. In the short space that intervened between the issuance of the proclamation and the actual declaration of war, the position of the United States was that of armed neutrality.

The indorsement of the President's action by the country at large was made the more emphatic because of a sensational episode growing out of the correspondence of the German Foreign Secretary with the German Minister to Mexico. A letter was published March 1 that was dated Jan. 19, 1917, and signed by Zimmermann, German Foreign Secretary. It told the German Minister, Von Eckhardt, that Germany intended on Feb. 1 to begin unrestricted submarine warfare, and that this might endanger relations with the United States. In that event, Von Eckhardt was directed to propose to Mexico that she and Germany make war and make peace together. Germany was to furnish financial support to Mexico, and the latter was to recover her "lost territory" in New Mexico, Arizona and Texas. The "details" of this program were to be left to Von Eckhardt. As if this large order were not enough, he was also to suggest that the President of Mexico communicate this plan to Japan and seek to secure the latter's adherence.

While the ingenuousness of the plan was not without its elements of humor, the publication of the letter hardened the determination of the United States to pursue the course it was treading, even if it should lead to war. The revelation of diplomatic clumsiness was particularly disconcerting to Germany and the pro-German elements in this country. The letter was denounced in some quarters as a patent forgery, but on March 3, Zimmermann himself acknowledged that it was genuine and sought to defend it. Mexico made haste to deny any implication in the matter and Japan denounced it as a "monstrous plot" that, if proposed to the Japanese Government, would not be entertained for an instant. These disclaimers, which in the case of Japan at any rate was unnecessary, were accepted by our Government, and interest in the matter was soon lost in the greater events that followed.

For the American Government had at last decided on war as the only solution consistent with American dignity and honor. Its patience had been exhausted and its people goaded to the utmost. The sinkings grew in volume, and it was evident that Germany had thrown discretion to the winds and was daring the American people to meet the issue. On March 2, the American steamship, "Algonquin," on its way from New York to London, was attacked by a submarine without warning and sunk, the crew being rescued later, after 27 hours in open boats. On March 18 three ships bearing the American flag were sunk off the English coast by submarines. These were the "City of Memphis," the "Illinois" and the "Vigilancia." Fifteen of the crew of the latter were lost.

On the day after this news was received many measures were taken by this Government that foreshadowed the coming conflict. Orders were given to speed up work on warships under construction; two classes of midshipmen were ordered to be graduated ahead of time; the eight-hour day for Government naval work was suspended, arrangements were made for the issue of bonds for naval purposes. A long Cabinet session was held, at which it was decided that Congress should be called in session at an earlier date than that previously announced. On March 21 the President issued a call for Congress to meet on April 2, "to receive a communication by the Executive on grave questions of national policy which should immediately be taken under consideration." No one doubted that this sentence could be compressed into a single word—war.

The Sixty-fifth Congress convened in special session at noon on April 2. The President, escorted by a squadron of cavalry, reached the Capitol in the evening. At about 8.40, he began his address, after having been greeted with a tremendous ovation. He spoke for 36

minutes and was listened to with breathless attention. He recited the offenses of Germany against this Government, and recommended Congress to declare "the recent course of the Imperial German Government to be in fact nothing less than war against the Government and people of the United States" and that Congress "formally accept the status of belligerent that had thus been thrust upon it." A notable passage of the speech was that in which he defined the issue as one between autocracy and democracy. "The world must be made safe for democracy. Its peace must be planted upon the tested foundations of political liberty. We have no selfish ends to serve. We desire no conquest, no dominion. We seek no indemnities for ourselves, no material compensations for the sacrifices we shall freely make. We are but one of the champions of the rights of mankind."

At the conclusion of the President's address, he was wildly cheered, the whole audience rising to its feet and waving flags. Immediately after the President's withdrawal, both Houses assembled in separate session, and bills were introduced embodying the President's recommendations. On April 4, by a vote of 82 to 6, the war resolution was passed by the Senate. On April 6 it was passed by the House of Representatives by a vote of 373 to 50. At 1.18 p. m., it was signed by the President, thus making the United States and Germany officially at war. Simultaneously the President issued an address to the American people, announcing the existence of a state of war and prescribing rules for the behavior and treatment of enemy aliens.

The text of the Declaration of War was as follows:

Whereas, the Imperial German Government has committed repeated acts of war against the Government and the people of the United States of America; therefore be it

Resolved, by the Senate and House of Representatives of the United States of America in Congress assembled, That the state of war between the United States and the Imperial German Government, which has thus been thrust upon the United States, is hereby formally declared; and

That the President be and he is hereby, authorized and directed to employ the entire naval and military forces of the United States and the resources of the Government to carry on war against the Imperial German Government; and to bring the conflict to a successful termination all the resources of the country are hereby pledged by the Congress of the United States.

The declaration was received by the nation without any outburst of hysterical excitement. Its coming had been too apparent to have in it any element of surprise. But except in some pacifist quarters, it was received with the heartiest approval and a whole-souled determination to bend every effort toward securing victory. It had been feared that riots would be instigated by some of the 10,000,000 citizens of Teutonic birth and sympathies, but although there were some minor disorders, less than 100 arrests in all were made. The Socialist party alone expressed formal opposition to the war, and lost a considerable part of its following in consequence. Rarely has a nation facing a great conflict been so united in spirit and purpose. It is true that the great body of the people failed to realize the great part that America was to take in the war. It was generally expected that our participation would be limited to the navy and to the furnishing of money, munitions and food. That we should be called upon to raise an army of 5,000,000 men, of whom more than 2,000,000 would be actually carried overseas was probably believed by none. But even if it had been, there would have been no softening of the national purpose to prosecute the war to a successful termination.

By the nations of the Entente, the decision of the United States was received with the greatest relief and enthusiasm. They saw certain victory in the accession of so formidable an ally. By the neutral nations also, who had so many causes for grievance against Germany, the declaration was in general approved, though from motives of discretion their expressions were restrained. Some of them, however, deemed the action regrettable, because they had pinned their hopes to America's mediation in securing the world's peace.

Germany received the news with blended feelings. In many influential quarters there was a frank acknowledgment of the seriousness of the step that placed the richest and most powerful nation in the world on the side of her enemies. Others ridiculed the military power of this country, and predicted that our opposition would prove negligible. It was urged that redoubled efforts be made to crush the forces of the Entente, before America's help could be made available. It was freely prophesied that the submarines would prevent any American transport from landing troops in France. And even if this hope failed and American troops were brought into ac-

tion, it was declared that they could never sustain the onset of German veterans.

Although there had been much complaint of the country's unpreparedness for war, prior to the declaration, there was no legitimate ground for criticism of the energy and resolution with which all departments of the Government began to function, immediately after the state of war became a fact. The instant the news was flashed from Washington, port officials everywhere, accompanied by detachments of Federal troops, seized all German ships that were lying in American Harbors. There were 91 of these in all. With the exception of a German gunboat at Manila, that was blown up by its officers, all were taken possession of without serious incident. The crews were interned at stations on shore, and Government machinists were put at work repairing the damaged machinery of the vessels.

The radio system throughout the United States was also taken under Government control. Every wireless station, not only on this continent, but also in all our island possessions, was seized on April 6, in conformity with the order of President Wilson. Those that might be useful were retained in operation, but others were dismantled and suppressed. All amateur wireless plants were forbidden to function.

Barred zones were established about the entire coast line of the United States, varying in width from two to ten miles. Vessels were forbidden to enter ports at night, and their ingress and egress in the daytime were conformed to strict rules that were enforced by an extensive coast patrol.

Hand in hand with these defensive measures, went energetic preparation for offense. Even prior to the declaration of war, orders had been issued March 25-26, for the mobilization of 37 units—regiments and battalions—of the National Guard, for the purpose ostensibly of policing threatened points but really to get ready for war. The 22,000 men who had been on border duty near Mexico, though they were due to be mustered out, were retained in the service. By April 1, more than 60,000 of the entire National Guard of 150,000 men were under arms, and the mobilization had outrun the equipment that was ready for them.

In the Navy, also, work was rushed with all possible speed. An executive order was issued, March 26, increasing the enlisted naval strength to 87,000 men. Ensigns were rushed from Annapolis three months before graduation. The marine corps was increased to 17,000 men. Retired officers were called back for bureau work, so that younger men might be released for active service. By June 6, American warships had arrived off the coast of France. Naval bases were established on both the French and English coasts as stations for American destroyers, co-operating with the Allied navies against German submarines. In addition, over 200 merchantmen had been provided with guns and crews to work them before the end of August.

Army work was necessarily slower, because of the magnitude of the demands of this arm of the service. The regular army had been recruited to its full authorized strength of 300,000 men by August 9. By August 5, the National Guard regiments had also swelled to their full strength of 300,000 men. The aggregate fighting strength of the two bodies was 650 000 men, many of whom had been well drilled, but most of whom had seen no actual fighting. And much of what these knew had to be promptly unlearned, in order to conform to the new tactics and strategy developed by the war.

By this time, the conviction had dawned upon the nation and its leaders that military operations must be participated in by American troops on a vastly greater scale than had been anticipated at the beginning. At first it had been thought possible to increase the armies to the required size by voluntary enlistments. But it soon became evident that other methods must be adopted, if America's intervention was to be prompt and effective.

Conscription had an unpleasant sound to American ears, but its necessity became so apparent that the Selective Draft Act, when it was approved on May 18, met with general approbation. The first application of the act resulted in the registration of over 9,500,000 young men on June 5, and the subsequent calling into service from this number of 687,000 on July 20. So energetically was the work carried on that by the end of August the men were streaming into the cantonments and army posts that had been selected as training grounds. Thirty-two great cantonments in various parts of the country were planned and built in record time, and great numbers of officers were being trained at Plattsburg and similar camps established for that purpose.

The legislative branch of the government made movements on so great a scale possible by liberal appropriations. Partisanship was laid aside, and both

parties stood loyally behind the Executive in all action looking toward a successful prosecution of the war. On June 15 an appropriation bill carrying over $3,000,000,000 for army and navy purposes was signed by the President, and a little over a month later an appropriation of $640,000,000 was made for the aviation service. It was estimated by Secretary of the Treasury McAdoo on July 24, that $5,000,000,000, in addition to what had been already authorized, would be necessary to finance the war up to June 30, 1918. Taxation and the issue of bonds on an unprecedented scale were foreshadowed by this announcement, but the sacrifice was cheerfully made. The first Liberty Loan which called for two billion dollars was oversubscribed by more than a billion. The campaign for the loan opened May 2, and closed June 15, and its raising was attended by a spirit of enthusiasm and patriotism that showed how deeply the nation was stirred.

The enormously important economic feature of national defense was not overlooked. It was realized that this was a war of resources and that the nation that could hold out for "the last quarter of an hour" would win. A nation-wide system of activities was organized that enlisted the ablest business minds of the country in the Council of National Defense, which had as its official nucleus the members of the Cabinet. The Council was sub-divided into a number of committees, each headed by a recognized expert, and their work went on under the control and supervision of the various Government departments. Herbert C. Hoover, who had demonstrated his executive ability by his work in connection with the Belgian Relief Commission, was made the head of the Food Board, whose work was to mobilize the agricultural resources of the country, stimulate economy and production, prevent waste and assure an adequate food supply not only for civilians but for the army and navy, as well as to supplement the failing resources of the Allied nations. The operation of the railroads was put under the control of a railway board, in order to prevent freight congestion and send goods by the quickest and shortest routes. A committee on raw materials saw to it that the Government secured the requisite amount of copper, steel and other products. The Federal Shipping Board was authorized to build a fleet of wooden cargo ships, 1,000 in number and from 3,000 to 5,000 tons burden. These, it was figured, would make up largely for the damage done to shipping by the submarines, and keep up a steady stream of supplies to Europe.

Important acts passed by Congress strengthened the hands of the Executive. The Espionage Act dealt with internal foes, with especial bearing on the activities of resident enemy aliens. Death or imprisonment was provided for convicted spies. Penalties were appended for any interference with commerce carried on with the Allied nations. More rigid restrictions were put on passports. The use of search warrants was extended. The Embargo Act provided for a system of licensing the transfer of commodities abroad, and was designed to prevent supplies being shipped to neutral ports which might get into the hands of Germany, either through deliberate design or through the natural channels of trade. The act was resented by neutrals, who feared that their legitimate needs might go unsupplied, but it was warmly welcomed by the Allies, who saw in this tightening of the blockade against Germany an effective means of shortening the war.

While the cause of the Allies was being strengthened by the accession of the United States, it was being weakened by the threatened collapse of Russia. That nation, whose great work in the early years of the war had done so much toward barring Germany's path to conquest, was threatening to withdraw from the conflict. The breakdown of the entire Eastern front was foreshadowed. The Czar had been overthrown, disintegrating forces were everywhere at work, and the former empire was in a welter of chaos and confusion. The serious results to the Allied cause of Russia's defection were apparent. The Central Powers, relieved of the necessity of fighting on two fronts, could concentrate on one. Rumania, deprived of Russia's support, would fall an easy prey to the German armies. A million men could be hurried across Germany to be hurled against the hard-pressed Allies in the west. Austria would be able to give her undivided attention to Italy. The war would be prolonged indefinitely, and immensely greater demands would be made on American blood and treasure than had been anticipated.

To prevent this calamity, it was thought advisable by the United States Government that a commission be sent to Russia to assure her of this country's sympathy and support, to urge her adherence to the cause of the Entente, and to promise help in developing her resources and re-establishing her transportation system, that had utterly broken down. The Commission was headed by Elihu Root, former Secretary of State, and comprised naval and military officials, practical railway men and

representative citizens. It reached Petrograd June 13, 1917, and was received with respect, and in some quarters with cordiality. The aims of the Commission had been previously communicated to the Russian Government then in power by President Wilson. The work of the Commission was carried on with great energy and ability, and by July 10 Mr. Root was so encouraged that he declared that it had accomplished what it had gone to Russia to do and that it had found "no organic or incurable malady in the Russian democracy." This same view was held by him when the Commission returned to the United States and made its report to Washington on Aug. 12. Events, however, showed that he had been too optimistic. Russia passed from democracy to Bolshevism and withdrew from the war. Still, the Root Commission had a real value in deferring, if it could not prevent, the Russian collapse.

Military preparations went on with increased energy as the signs of Russian weakening multiplied. On Aug. 14, President Wilson sent to the Senate for confirmation the names of 37 major-generals and 147 brigadier-generals, whom he had appointed as officers in the National Army. Radical changes were made in army organization to embody the lessons learned by the Allies in three years of war. The ratio of artillery strength to infantry was greatly increased. It was ordered that there should be three regiments of field artillery to every four regiments of infantry, instead of the former ratio of three to nine. The machine-gun arm was also materially enlarged. The one regiment of cavalry, that was previously a unit in every division, was abolished, as cavalry had been shown to be a comparatively unimportant factor in the war, except in the Far East. Many new services were provided for, such as gas and flame service, forestry regiments, trench, mortar, anti-aircraft and chemical units demanded by the exigencies of this greatest of all wars.

A notable episode and one that symbolized to the world the actual entry of America into active warfare was the arrival in Europe, June 8, 1917, of Major-General John J. Pershing, who had been chosen as Commander-in-Chief of the American Expeditionary Forces abroad. He was accompanied by his staff of 53 officers and 146 men. He received an enthusiastic greeting in London and a thrilling welcome in France, he was looked upon as the leader of a coming army of 20th Century Crusaders. He visited the tomb of Napoleon and laid a wreath on the tomb of Lafayette. Long conferences were held with the military authorities regarding American participation in the conflict. It was announced that General Pershing would determine where the American expedition should be sent, and that his decision would be final. He was to be an independent commander, in absolute control of his own forces, but co-operating with the British and the French. This arrangement continued in force until, as will be narrated later, General, afterward Marshal, Ferdinand Foch was made Generalissimo of the Allied forces, March 28, 1918.

The first units of the United States army that were to fight abroad reached a French port on June 26 and 27. They had been despatched in compliance with a Presidential order of May 18. They received a magnificent welcome from enormous crowds while bands played the "Star Spangled Banner" and the "Marseillaise." The detachment was under the command of Major-General William L. Sibert. They and the troops that soon began to follow in an ever increasing stream were placed in French camps behind the firing line, where they were given intensive training by war veterans of the French and British armies. After this training was completed, they were placed in the trenches on comparatively quiet sectors near Toul and in Lorraine. The Germans soon learned of their presence, and subjected them to artillery fire, gas attacks and bombs dropped from airplanes. The Americans, in conjunction with the French, took part in trench raids and minor operations, and soon a growing casualty list gave warning of the sacrifice of life that was to be demanded of America before victory could be achieved.

The pressing need of shipping to transfer men and supplies to France was met in several ways. By Jan. 29, 1918, it was announced that the damage done by the crews to the seized German ships had been repaired, thus making available a tonnage of over 600,000. By an agreement with Japan and some of the neutral nations, 400,000 more tons were added to the total. On March 14, the United States and Great Britain announced their intention of seizing over 600,000 tons of Dutch shipping that was lying in their harbors, making compensation for them at the end of the war, in the meantime supplying food and fuel to Holland. This action was protested by the Dutch Government, though it was strictly in accordance with the principles of international law, and was duly carried out.

It was stated in Washington on Nov. 7, 1917, that the army at that time was 1,800,000 strong. A movement was set on foot to classify the 9,000,000 regis-

trants under the first draft, putting into Class I those who were unmarried or without dependents, and making them the first ones subject to the nation's call. It was believed that by this method, 2,000,000 more men would be made almost immediately available for service.

Notable among the non-military events shortly following the advent of America as a combatant had been the Pope's appeal for peace. This was made public in this country on Aug. 16, 1917. The letter was couched in a benevolent form, and was received with respect because of the position held by the author and the lofty sentiments that inspired it. Pope Benedict, after deploring the horrors of the conflict, suggested as a basis of settlement a decrease of armaments, the freedom of the seas, no indemnity, the evacuation of Belgium, and the restitution of the German colonies. While the appeal was addressed to all the belligerents, the answer of the Entente was embodied in a reply to the letter made by President Wilson on Aug. 27. He pointed out that the Pontiff's proposal practically involved a return to the status quo ante. This, in view of Germany's unrepentance and continuing ambition, would only give that Government time for a recuperation of its strength and renewal of the attack upon civilization. He declared that "we cannot take the word of the present rulers of Germany as a guarantee of anything that will endure unless explicitly supported by such conclusive evidence of the will and purpose of the German people themselves as the other peoples of the world would be justified in accepting."

The answer was approved heartily by all the nations of the Entente. By the German Government and press it was bitterly denounced as an attempt to drive a wedge between the Government and the people. The replies of the German Powers to the Pope, while sympathetic, were non-committal, and the intervention had no result.

The alertness of the American Secret Service, which had previously caused Germany such discomfiture by the publication of the Zimmermann note, was illustrated anew on Sept. 8, 1917, by the giving to the world of certain telegrams that had been sent in cipher to the Berlin Foreign Office by the German Chargé d'Affaires at Buenos Aires, Argentina. As a demonstration of perfidy and heartlessness, it created an immense sensation. It was dated May 19, 1917, and read:

"This Government has now released German and Austrian ships on which hitherto a guard had been placed. In consequence of the settlement of the Monte (Protegido) case there has been a great change in public feeling. Government will in future only clear Argentine ships as far as Las Palmas. I beg that the small steamers 'Oran' and 'Guazo,' 31st of January, 300 tons, which are now nearing Bordeaux with a view to change the flag, may be spared if possible or else sunk without a trace being left (spurlos versenkt). LUXBURG."

Other despatches described the Argentine Acting Minister for Foreign Affairs as a "notorious ass and Anglophile." But it was the "spurlos versenkt" cipher, recommending the butchery if necessary of helpless crews so that their fate might never be known, that stirred the world with indignation. In Argentina the feeling was exceedingly bitter and German shops were wrecked and newspaper offices burned. Luxburg was promptly given his passports by the Argentine Government.

America was chiefly concerned, however, by the fact that the Swedish Legation at Buenos Aires had allowed itself to be used for the transmission of the despatches. This was regarded as a serious breach of neutrality. The Swedish people themselves severely criticised their Government in the matter. The Swedish Government, on Sept. 15, announced that no further messages of any sort would be forwarded for Germany from any point. The German Government on Sept. 17 expressed "keen regret" for the embarrassment that had been caused Sweden by the incident.

On Dec. 7, 1917, the United States declared war on Austria-Hungary. The resolution declaring that a state of war existed between the two countries was passed in the Senate by a unanimous vote and in the House by 363 to 1, the single negative vote being cast by a New York Socialist member. The joint resolution, after declaring that the Imperial and Royal Austro-Hungarian Government had committed repeated acts of war against the Government and the people of the United States of America, followed closely in its phrasing the declaration against Germany. The action was largely formal, for it merely stated what had been actually the fact for months, and involved no special changes in our naval or military preparations. As regards internal relations, the same policy was adopted toward resident Austrian aliens and their property and ships as had previously been pursued toward Germans.

The question naturally arose why war was not declared at the same time on Turkey and Bulgaria, who were Allies of Austria and Germany. Several reasons for the omission were given semi-officially by Government spokesmen. It was

stated that Turkish citizens and interests in the United States were so few as to be negligible, and that on the other hand American citizens were numerous in Turkey and had considerable business interests and property that might be endangered by a war declaration. Moreover, the staunchness of Turkey's fidelity to the cause of the Central Powers was questioned, and it was thought that she might be induced to conclude a separate peace. In Bulgaria's case it was pointed out that her interest in the war was largely local, and that in defiance of Germany's command she had refused to break off diplomatic relations with this country. Whatever action the Government might take in the matter was after all academic. Germany was the real enemy, and if she were conquered, her allies would be compelled also to submit.

Perhaps the most important statement of war aims in the whole course of the conflict was that made by President Wilson in a memorable address to Congress, Jan. 8, 1918. It was in this that he stated the famous "Fourteen Points" about which discussion ranged from then until and after the close of the war. They are of such historic importance that they are here subjoined in full:

"The program of the world's peace, therefore, is our program, and that program, the only possible program, as we see it, is this:

I. Open covenants of peace, openly arrived at, after which there shall be no private international understandings of any kind, but diplomacy shall proceed always frankly and in the public view.

II. Absolute freedom of navigation upon the seas, outside territorial waters, alike in peace and in war, except as the seas may be closed in whole or in part by international action for the enforcement of international covenants.

III. The removal, so far as possible, of all economic barriers and the establishment of an equality of trade conditions among all the nations consenting to the peace and associating themselves for its maintenance.

IV. Adequate guarantees given and taken that national armaments will be reduced to the lowest point consistent with domestic safety.

V. A free, open-minded, and absolutely impartial adjustment of all colonial claims, based upon a strict observance of the principle that in determining all such questions of sovereignty the interests of the populations concerned must have equal weight with the equitable claims of the Government whose title is to be determined.

VI. The evacuation of all Russian territory and such a settlement of all questions affecting Russia as will secure the best and freest co-operation of the other nations of the world in obtaining for her an unhampered and unembarrassed opportunity for the independent determination of her own political development and national policy and assure her of a sincere welcome into the society of free nations under institutions of her own choosing; and, more than a welcome, assistance also of every kind that she may need and may herself desire. The treatment accorded Russia by her sister nations in the months to come will be the acid test of their good-will, of their comprehension of her needs as distinguished from their own interests, and of their intelligent and unselfish sympathy.

VII. Belgium, the whole world will agree, must be evacuated and restored, without any attempt to limit the sovereignty which she enjoys in common with all other free nations. No other single act will serve as this will serve to restore confidence among the nations in the laws which they have themselves set and determined for the government of their relations with one another. Without this healing act the whole structure and validity of international law is forever impaired.

VIII. All French territory should be freed and the invaded portions restored, and the wrong done to France by Prussia in 1871 in the matter of Alsace-Lorraine, which has unsettled the peace of the world for nearly fifty years, should be righted in order that peace may once more be made secure in the interest of all.

IX. A readjustment of the frontiers of Italy should be effected along clearly recognizable lines of nationality.

X. The peoples of Austria-Hungary whose place among the nations we wish to see safeguarded and assured, should be accorded the freest opportunity of autonomous development.

XI. Rumania, Serbia, and Montenegro should be evacuated, occupied territories restored, Serbia accorded free and secure access to the sea, and the relations of the several Balkan states to one another determined by friendly counsel along historically established lines of allegiance and nationality, and international guarantees of the political and economic independence and territorial integrity of the several Balkan states should be entered into.

XII. The Turkish portions of the present Ottoman Empire should be assured a secure sovereignty, but the other nationalities which are now under Turkish rule should be assured an undoubted security of life and an absolutely unmolested opportunity of autonomous development, and the Dardanelles should be permanently opened as a free passage to the ships and commerce of all nations under international guarantees.

XIII. An independent Polish state should be erected which should include the territories inhabited by indisputably Polish populations, which should be assured a free and secure access to the sea, and whose political and economic independence and territorial integrity should be guaranteed by international covenant.

XIV. A general association of nations must be formed under specific covenants for the purpose of affording mutual guarantees of political independence and territorial integrity to great and small states alike.

A reply to this statement of principles, that in the view of the United States must serve as the only possible basis of peace, was made by the German Chancellor, Von Hertling, in the Reichstag on Jan. 24, 1918. The speech was evasive on many points. He flatly refused to consider the cession of Alsace-Lorraine. He accepted the President's views in regard to secret diplomatic agreements. The question of disarmament he agreed was discussable. He favored the freedom of the seas with the elimination of the naval bases of England at Gibraltar, Malta and other points. Belgium, he declared, was regarded by Germany as "a pawn"—an unfortunate expression that he afterward strove lamely to explain away—and the question could be settled at the Peace Conference. Other ques-

tions, he alleged, concerned Germany's allies and could only be settled after consultation with them.

On behalf of Austria-Hungary, Count Czernin on the same day answered the President's speech, in an address before the Austrian Parliament. His tone was more friendly and his concessions more unreserved than those of the German Chancellor, but he went no further than his ally in definite promises, except in the case of Poland.

On Feb. 11, President Wilson again addressed Congress in what was practically a reply to Von Hertling and Czernin. He declared that the method proposed by the former was that of the discredited Congress of Vienna, and that the German Chancellor in his thought was living in a world that was past and gone. Czernin, the President agreed, saw more clearly, and doubtless would have gone further yet in the way of concession, had he not been bound to silence by the interests of his allies.

Once more the President sought to state in more compact form—in four points this time instead of 14—what he regarded as the fundamental conditions of durable peace.

First—That each part of the final settlement must be based upon the essential justice of that particular case and upon such adjustments as are most likely to bring a peace that will be permanent.

Second—That peoples and provinces are not to be bartered about from sovereignty to sovereignty as if they were mere chattels and pawns in the game, even the great game, now forever discredited, of the balances of power; but that

Third—Every territorial settlement involved in this war must be made in the interest and for the benefit of the populations concerned, and not as a part of any mere adjustment or compromise of claims among rival states; and,

Fourth.—That all well-defined national aspirations shall be accorded the utmost satisfaction that can be accorded them without introducing new or perpetuating old elements of discord and antagonism, that would be likely in time to break the peace of Europe and consequently of the world.

Whatever expectation might have been entertained that this restatement of principles would elicit a reply that would bring peace appreciably nearer, was doomed to disappointment. The iniquitous treaty of Brest-Litovsk with Russia had put that country definitely out of war, and had released vast forces that could now be used in a savage onslaught on the western front. The German war party was in the saddle, and felt that it had a chance to dictate peace instead of negotiating it. Enormous preparations were made for the great drive at the opening of the Spring campaign, that Germany confidently expected would bring a victorious end to the war, and all thought of further peace parleys was abandoned.

Though the loss of American lives at this stage had not reached considerable proportions, America was feeling the economic strain caused by the necessity of having to send food and fuel to the Allies. An order was issued by Fuel Administrator Garfield on Jan. 16, 1918, providing for a series of "heatless" days in all parts of the country east of the Mississippi river from Jan. 18 to 22 inclusive and on each following Monday from Jan. 28 to March 25 inclusive. This did not apply to private dwellings, but to manufacturing plants, business offices, theaters, and the like, with certain stated exceptions. The order was criticized in some quarters as needless, but it had the endorsement of the President and was generally obeyed.

The tremendous demands upon the railroads in the matter of transporting troops and supplies led to a condition of congestion and paralysis that caused the Government on Dec. 26, 1917, to assume full control of all the railroad systems in the country. This represented 260,000 miles and a property investment of $17,500,000,000 while 1,600,000 employes were required for operation. Steps were at once taken by the Government to unify competing lines into one general system to prevent reduplications, to supply equipment that might be lacking, and to bill all freight by the shortest and quickest routes. The control of the vast system was vested in Secretary of the Treasury McAdoo. The property rights of stockholders were to be protected. The action was generally approved by the country as a measure imperatively necessary for the prosecution of the war.

Criticism was not lacking, however, of some features of the work of the Administration. A severe attack was made on the conduct of the War Department by Senator Chamberlain, Chairman of the Military Committee of the Senate, who declared in a public speech that the military establishment had broken down and that there was inefficiency in every Government bureau and department. His Committee the next day introduced into the Senate a bill to create a Minister of Munitions and to establish a special War Cabinet of three, which should have complete charge of war operations.

The charges were promptly denied by Secretary Baker, who was also warmly defended by the President. The Secretary at his own request was given an opportunity to appear before the Senate Military Committee on Jan. 28 and reply to the criticisms leveled at his department. He admitted that there had been delays, mistakes and false starts, but asserted that these were only the inevitable accompaniments of work prosecuted on such a colossal scale, and that in general the accomplishments of the Administration deserved praise rather than rebuke. He explained the delay in furnishing rifles and ordnance, and to the charges of hospital neglect, replied that in an army of over a million men only eighty complaints had been made of neglect or abuse. All defects and shortcomings, he declared, were being remedied as rapidly as possible.

Whatever may have been the merits of the case, the criticism resulted in a quickening of Government effort and a thorough reorganization of the War Department. An order was issued by Secretary Baker on Feb. 10, 1918, directing the establishment of five divisions of the General Staff as follows:

1. An Executive Division under an executive assistant to the Chief of Staff.
2. A War Plans Division under a Director.
3. A Purchase and Supply Division under a Director.
4. A Storage and Traffic Division under a Director.
5. An Army Operations Division under a Director.

The authority of the Chief of Staff was emphasized, and it was believed that this concentration of authority would result in greatly increased efficiency. The new organization began functioning at once, and the results speedily became apparent in the more rapid movement of troops and supplies to France.

A serious disaster to the naval arm of the service occurred Feb. 5, 1918, when the British steamship, "Tuscania," which was engaged as a transport in carrying United States troops to France, was torpedoed by a German submarine. The attack took place off the north coast of Ireland. There were 2,179 American soldiers on board, and of these nearly two hundred lost their lives.

The vital problem of financing the war for ourselves and in large part for our Allies continued to be met by the issue of loans. The second Liberty Loan closed on Oct. 27, 1917, and amounted to $4,617,532,300. As the amount asked for was three billions, this represented an oversubscription of 54 per cent. The total of subscribers was 9,400,000. This number of buyers, vast as it was, was exceeded by those for the third loan which closed on May 4, 1918, with a subscription of over four billions, a billion more than was requested. On this occasion the buyers exceeded 17,000,000. The results were exceedingly gratifying, not only because of the amounts secured, but because of the popular determination to win the war evinced by the widespread distribution of the loan.

The treaties of Germany with dispirited Russia at Brest-Litovsk and with vanquished Rumania at Bucharest had revealed anew the cynicism of the German Government, and the threat that was held out to all the free peoples of the world, if the war should result in final German triumph. President Wilson, in an address on the treaties delivered at Baltimore, April 6, 1918, reviewed the events that led up to and followed them, and gave utterance to the "Force to the utmost" phrase which stirred the nation like a clarion call.

"Germany has once more said that force and force alone shall decide whether justice and peace shall reign in the affairs of men, whether right as America conceives it or dominion as she conceives it shall determine the destinies of mankind. There is therefore but one response possible for us: Force, force to the utmost, force without stint or limit, the righteous and triumphant force which shall make right the law of the world and cast every selfish dominion down in the dust."

The real baptism of fire for the American troops in France was now beginning. Hitherto there had been scattered and comparatively small actions, which had, however, demonstrated American pluck and mettle. American army engineers working on the British railways near Gouzeaucourt, on Nov. 30, 1917, had been caught in the swirl of an unexpected German attack. They had dropped their picks and shovels, grasped rifles wherever they could find them, and fought side by side with the British repelling the assault. The French communiqué rendered "warm praise to the coolness, courage and discipline of these improvised combatants."

The first action of note, although still only a minor operation, in which Americans took part was the affair at Seicheprey in the Toul sector, April 20, 1918. A force of Germans numbering about 1,500, of whom a considerable portion were shock troops, launched itself against the American trenches on a one-mile front. The attack had been preceded by a heavy bombardment. Gas as

well as shells were used. The force of the attack carried the Germans into the first line of defense and the village of Seicheprey. There was fierce hand to hand fighting, but that same day the Americans regained most of the captured ground and the following morning completed the work and re-established their lines. Our losses were between 200 and 300 while the enemy's losses were much heavier.

Ten days later the Americans were called upon to repel another heavy assault at Villers-Bretonneux. After a heavy bombardment at 5 o'clock in the afternoon, a wave of the enemy swept forwárd, but was repelled after intense hand to hand fighting and retreated, leaving their dead and wounded behind them.

Nor should the courage be overlooked of about three hundred engineers who "held the gap" with Carey. It was just after the beginning of the great German drive that began on March 21, swept everything before it for the first few days, and threatened an overwhelming disaster to the Allied arms. The road to Amiens lay open through a breach that had opened up between the British 3d and 5th armies. Gen. Sandeman Carey was commissioned to hold the gap and he did it with a nondescript army made up of laborers, telegraph linemen and any others whom he could get together. The 300 American engineers joined in, and for days against desperate odds held the breach, until it could be closed definitely by the arrival of regular troops.

In the meantime, a momentous action had been taken—so momentous in fact that in all probability it decided the fate of the war. This was the appointment of General Ferdinand Foch to be Generalissimo of the Allied armies. The Allies had been hampered throughout the conflict by the various armies representing the Entente being under the control of their own generals. This led inevitably to diversity of plan and action, as distinguished from the Germans who were a unit. No matter how greatly the need of harmony among the Allies was recognized, it was impossible to secure it in fact. The English were moved by the supreme desire to bar the way to the Channel ports. The French desired to protect Paris at any cost. Each nation had a certain reluctance to send re-enforcements to the other, for fear that their own special interests might be weakened by the action. In case of a difference in views on strategy or tactics, there was no supreme power that could decide the question.

The need of unity became especially apparent a week after the beginning of the great German drive of March 21, 1918. During that week, the Germans had met with enormous successes, gaining a vast area of territory and many thousands of prisoners. It was the blackest week in the entire war for the Allied cause. There was no further hesitation. On March 28 General Pershing called upon General Foch who on that same date had been made Generalissimo, and placed at his disposal all the American troops and resources.

"I came to say to you," General Pershing said, "that the American people would hold it a great honor for our troops, were they engaged in the present battle. There is at this moment no other question than that of fighting. Infantry, artillery, aviation—all that we have are yours, to dispose of as you will."

The offer was accepted gratefully by the War Council and the following statement was issued:

"The American troops will fight side by side with the British and French troops, and the Star-Spangled Banner will float beside the French and English flags in the plains of Picardy."

By the time arrangements had been completed to utilize our troops, there were nearly 800,000 American soldiers in France, and they were coming across the seas in an apparently unending stream at the rate of 300,000 a month. America's weight was about to be thrown in the scales with decisive effect.

A deft and finished piece of work was the capture of the strongly held and fortified town of Cantigny N. W. of Montdidier. On May 28 the Americans, in conjunction with French artillery and tanks, attacked on a front of one and a quarter miles. They took the town in the first forward sweep and captured 200 prisoners besides inflicting severe losses on the enemy in killed and wounded. Repeated counter-attacks were made by the Germans in heavy force, but all were repelled.

Three days later the Americans distinguished themselves at Château-Thierry, a town that later was to become forever memorable because of the luster there shed on American arms. Units of the American Marine Corps, armed with machine guns, beat back an attack by heavy German forces on the town. They repulsed the Germans and took many prisoners, losing none of their own men as prisoners. Two more determined German attacks were beaten back a short time later on the Marne. On June 6 the Americans penetrated to a depth of two miles and took posses-

sion of the high ground N. W. of Château-Thierry. In a five-hour fight, they captured Bouresches and Torcy. Far bitterer was the fight that followed for the possession of Belleau Wood, where marines and regular soldiers won imperishable fame. The wood was densely forested, was defended by artillery and machine-gun nests and was held by the crack divisions of the German army. But the Americans pressed doggedly forward, gaining ground foot by foot, and at last in a headlong charge swept the remnants of the enemy forces from the wood, capturing hundreds of prisoners, while the ground was carpeted with German dead.

On July 1, at Vaux, the Americans, acting alone, captured the town in forty minutes, taking 500 prisoners. On July 4, in a great attack at Hamel, Independence Day was celebrated by the Americans in conjunction with the Australians by a victory that netted 1,500 prisoners. The resistance was determined, but the Americans advanced to the charge uttering the cry "Lusitania," and the fate of the day was decided.

The greatest action of the war so far for the Americans was that of July 15, when they stopped the thrust of the German Crown Prince toward Paris. The American forces were holding Jaulgonne and Dormans on the Marne. The Germans threw 25,000 of their best troops across the river. Under the shock of the great masses hurled against them the American line at first bent, but quickly rallied and threw the enemy back across the river. The Germans lost 10,000 men in killed and captured. Had the Germans broken through on that epic occasion, they would have had excellent chances of reaching the French capital.

On the following day, the Germans again attacked the American forces, only to be driven back with heavy loss. The Germans were wavering and confused. They had met with a sharp defeat, where they had confidently counted on victory. And at that critical juncture, Foch struck at them on a 28-mile front in the most magnificent counter-attack of the war. Americans in this attack were brigaded with the French troops under General Mangin and played a prominent part in the great advance to the Vesle and the Ourcq that followed the initial victory. South of Soissons, they pushed the Allied line farthest ahead. They took Fère-en-Tardenois in conjunction with the French. At Sergy, they drove the Germans beyond the Ourcq. On Aug. 1, after fighting of the severest kind, they stormed and captured Meunières Wood. At the Vesle American engineers, under fierce artillery fire, threw bridges over the stream, over which their comrades swarmed with a determination that would not be denied. In those weeks of continuous and bloody fighting the Americans were always at the front, and were everywhere victorious.

On Aug. 7, General Mangin issued the following order of the day:

Officers, Non-Commissioned Officers, and Soldiers of the American army:

Shoulder to shoulder with your French comrades, you threw yourselves into the counter-offensive begun July 18. You ran to it as if going to a feast. Your magnificent dash upset and surprised the enemy, and your indomitable tenacity stopped counter-attacks by his fresh divisions. You have shown yourselves to be worthy sons of your great country, and have gained the admiration of your brothers in arms.

Ninety-one cannon, 7,200 prisoners, immense booty and ten kilometers of reconquered territory are your share of the trophies of this victory. Besides this, you have acquired a feeling of your superiority over the barbarian enemy against whom the children of liberty are fighting. To attack him is to vanquish him.

American comrades, I am grateful to you for the blood you generously spilled on the soil of my country. I am proud of having commanded you during such splendid days, and to have fought with you for the deliverance of the world.

In the operations following this great victory the American force took a brilliant part in smashing the Hindenburg line. Their steady drive against the Crown Prince's army compelled its retreat on a twenty-mile line on Sept. 4, At the battle of Juvigny, Aug. 29, the Americans captured Juvigny plateau, one division conquering four of the best of the German divisions.

In the meantime, a great American attack was being prepared in the Lorraine sector entirely under the direction of General Pershing and his assistants. The plan and strategy were American throughout, as were the bulk of the forces employed, although some French troops co-operated under Pershing's command.

The St. Mihiel salient was a wedge that had been driven by the Germans into French territory in the vicinity of the village of that name, and had been held in force by them since the first invasion in 1914. It effectually prevented an Allied offensive in the direction of Metz. During four years the French had not been able to reduce it. The Americans undertook the task and for

weeks the most careful and intensive campaign was prepared. More than 100,000 detail maps were issued showing the character of the terrain and the posts held by the enemy. 40,000 photographs were distributed among the officers and men. Five thousand miles of wire were laid and 6,000 telephone instruments were connected with the wires. Nothing was left to chance, the result being one of the most signal and overwhelming victories of the war.

The position of the American army just preceding the battle is thus officially stated by General Pershing:

From Les Eparges around the nose of the salient at St. Mihiel to the Moselle river the line was, roughly, forty miles long and situated on commanding ground greatly strengthened by artificial defenses. Our 1st Corps (82d, 90th, 5th, and 2d Divisions), under command of Major-General Hunter Liggett, resting its right on Pont-à-Mousson, with its left joining our 3d Corps (the 89th, 42d, and 1st Divisions), under Major-General Joseph T. Dickman, in line to Xivray, was to swing toward Vigneulles on the pivot of the Moselle river for the initial assault. From Xivray to Mouilly the 2d Colonial French Corps was in line in the center, and our 5th Corps, under command of Major-General George H. Cameron, with our 26th Division and a French division at the western base of the salient, was to attack three difficult hills—Les Eparges, Combres, and Amaranthe. Our 1st Corps had in reserve the 78th Division, our 4th Corps the 3d Division, and our First Army the 35th and 91st Divisions, with the 80th and 33d available. It should be understood that our corps organizations are very elastic, and that we have at no time had permanent assignments of divisions to corps.

On Sept. 12, 1918, the assault was begun, and resulted in a sweeping victory. The tanks in advance broke down the enemy entanglements, and a tremendous artillery fire prepared the way for the dash of the infantry. The attack began at dawn, and within 27 hours after the beginning of the offensive, the Americans had recaptured 155 square miles of territory and had taken 433 guns and 16,000 prisoners, together with vast stores of munitions and supplies. The remainder of the enemy, numbering about 100,000, fled in hasty retreat. The victory freed Verdun from the menace of the German threat against its flank, put the dominating heights of the Meuse in American hands and cleared the way for an advance toward the Briey basin and the fortress of Metz.

While our soldiers abroad were thus demonstrating that as fighting men they had no superiors in the world, renewed endeavors had been made in this country to augment the size of American armies. A new draft law was enacted by Congress and signed by the President on Aug. 31, 1918, extending the American draft ages to all males between 18 and 45 inclusive. The number of men estimated to be affected by this law was about 13,000,000. The day of registration was set as Sept. 12, which by a coincidence chanced to be the date of the victory of St. Mihiel. It was believed that about 2,300,000 men could be obtained for military service under this registration. This would make it possible for America's total army in the field to be brought to 5,000,000 men, of whom it was believed that eighty divisions aggregating 4,000,000 could be in France by June 30, 1919. This would leave 18 divisions to be trained and held in readiness at home. It was a colossal program, and would doubtless have been carried out, had not the collapse of the Central Powers made it unnecessary.

The work of the American army at St. Mihiel was equalled by the operations of other units that were brigaded with the Allies. The 27th and 30th Divisions were brigaded with the British troops and fought in company with the Australians in the brilliant series of attacks that smashed the Hindenburg line in the vicinity of the St. Quentin canal, Sept. 29-Oct. 1. They reached all their objectives, despite the most bitter artillery and machine-gun resistance. In less than two weeks they had overrun the enemy's lines to a depth of thirteen miles and had captured 6,000 prisoners. Their casualties were heavy, but did not compare with those inflicted upon the enemy.

Two other divisions, the 2d and 36th, aided the French in driving the Germans from positions they had held for four years in the Rheims sector. In the week Oct. 2-9, they stormed and held the formidable position of Blanc Mount, and later captured the town of Ste. Etienne in bloody fighting. A little later, the 37th and 91st Divisions, which had been sent in haste to re-enforce the French troops operating in Belgium, took part in a brilliant advance that on Oct. 31 and Nov. 3 crushed the enemy's resistance, and drove his troops across the Escaut river, the American forces reaching the town of Audenarde. In Italy also American troops did gallant work in the last great Italian drive against Austria.

While these decisive operations were proceeding on the western front, United States troops were taking part also in

military activities in Russia and Siberia. Russia had by this time not only withdrawn its help from the Allies, but under Bolshevist domination had adopted an attitude of sullen if not active hostility. Vast quantities of American stores that had accumulaed at Vladivostok were imperiled, and it was determined that troops should be sent to protect them. This was the ostensible reason for the sending of the expedition, but there was another reason of much greater importance, based on political and military considerations. There was still a possibility that Russia might overthrow the hostile Bolshevist régime and establish a government that would once more range itself on the side of the Entente and rebuild the collapsed Russian front. Certain facts lent plausibility to this belief. A powerful body of Russian opinion was anxious to overturn the Lenine-Trotzky régime and form a constitutional government. In addition the Czecho-Slovaks had won decided military victories over the Bolshevist forces, and had revived hopes that that Government might be overthrown. The Czecho-Slovaks were prisoners who had been taken by the Russians in the early part of the war. They had been forced into the Austrian army, but they preferred captivity among the Russians to fighting under the hated flag of the Hapsburg monarchy. After the Russian debacle, these prisoners possessed themselves of arms, and fought their way across Russia and part of Siberia, with the intention of reaching Vladivostok and thence finding their way to the western front, to fight there in conjunction with the Allies (see CZECHO-SLAVIA). They offered the nucleus of an army that might by Allied reenforcements be made formidable, and therefore the Entente, in co-operation with America, decided to intervene. Early in August, 1918, American forces, under General William S. Graves and numbering about 10,000 men, arrived in Vladivostok. Japanese troops were sent about the same time, together with small British and French contingents. Even earlier than this, on July 15, a comparatively small detachment of Americans had landed with Allied troops at Murmansk, in the north of Russia. Desultory fighting, in no case rising above the dignity of outpost actions, followed the arrival of the troops. The story of the intervention is told elsewhere in detail (See RUSSIA IN THE WORLD WAR). It is sufficient here to say that the expeditions had no practical results. The forces at Archangel were withdrawn in 1919 and those at Vladivostok in 1920. It was simply a military adventure that had no practical bearing on the fortunes of war. The logic of events had decreed that the issue should be settled on the western front, and the Russian situation had ceased to be a factor in the struggle. The total casualties of the Americans in Siberia were 105; on the Archangel front 553.

The greatest battles in which the Americans were engaged were those of the Meuse-Argonne, in the fall of 1918. This epic struggle with its victorious outcome will ever be a glorious page in American history. The Argonne forest was the most formidable position that any troops had been called on to take in the entire course of the war. So formidable was it that Napoleon himself had refused to attack the enemy there, deeming the forest impregnable. It was densely wooded, and in places almost impenetrable. To these natural obstacles the Germans had brought all the aids known to military science. Thousands of miles of wire were stretched from bush to bush and tree to tree. Every foot of ground had been ranged for their heavy artillery. Machine-gun nests by the thousands were hidden in shell holes and behind rocks and tree trunks. Even many of the Allied commanders doubted if success were possible. The Americans, however, undertook the task, and carried it through to a successful conclusion. On Sept. 26, after intensive artillery fire that cut lanes through some of the wire entanglements, the American troops launched a vigorous attack that on the first day mastered the first line defenses. In the next two days, fighting against terrific resistance, they penetrated to a depth varying from three to seven miles, captured a dozen towns and took 10,000 prisoners. In successive days they improved their position and continued their advance in the face of almost insuperable obstacles. In the words of General Pershing in reporting the battle, the American troops "*should* have been unable to accomplish any progress, according to previously accepted standards, but I had every confidence in our aggressive tactics and the courage of our troops." By the middle of October, the important town of Grandprè had been taken and the forest practically cleared.

After this, the fighting was easier, though much stiff battling remained to be done before the Americans reached their goal. The enemy's morale had weakened before the irresistible onslaught and the successive defeats inflicted on them. Huge naval guns had been brought up by the Americans—guns capable of carrying a half-ton projectile almost twenty miles—and with these a

bombardment was begun that cut the Mézières-Sedan railway line, the chief German artery of supplies for their army. By the 6th of November, the Americans had reached a point on the Meuse opposite Sedan. From that moment the German cause was doomed. The enemy's line of communications had been cut, and only an armistice or abject surrender remained. In this gigantic offensive, the Americans had captured 468 guns and 26,059 prisoners.

Taking no more time than to give his soldiers a breathing spell the American commander was preparing an advance toward Longwy and the Briey coal fields and had already commenced the attack on the morning of Nov. 11 when the order came to suspend hostilities at 11 A. M. The armistice had been signed and the greatest war in history came to an end.

The series of disasters to German arms and the impending collapse of their allies were reflected in the changed tone of German statesmen at the beginning of autumn. Hindenburg, the military idol of the German people, issued a manifesto on Sept. 6, in which he acknowledged the severity of the struggle and exhorted the army to be on its guard against enemy propaganda. The Kaiser, speaking to the municipality of Munich, a day earlier, had admitted the difficulty of the present struggle against an enemy "filled with jealousy, destruction and the will to conquer." A week later, his agitation and apprehension were clearly marked in a halting address that he made to the workmen at Essen. The German Crown Prince supplemented his father's efforts by declaring that Germany had never wanted war and was fighting simply for her existence, ringed in as she was by a circle of foes. Von Hertling, Burian, and Czernin, in the same month, made addresses that were palpable bids for peace. There was no longer any arrogant talk about annexations and indemnities. Panic fear was beginning to spread among the statesmen of the Central Powers as they read the "handwriting on the wall."

The first open peace proposal was made in a communication by the Austro-Hungarian Government to the governments of all neutral and belligerent powers, dated Sept. 15. While the note ostensibly came from Austria alone, it developed later that it had received the approval of Germany. The note was carefully worded, was devoid of bitterness or arrogance, and asked that a confidential and "non-binding" discussion be entered into, that might clear away misunderstandings and pave the way to peace.

But the note came too late. It was regarded on all sides as an attempt to escape an impending military defeat by causing a slackening of effort on the part of the Allies while the retreating armies of the Central Powers should have a chance to regain their poise and vanishing morale. The offer was met with rejection by all the Entente nations. The refusal of our own Government was despatched on the same day that the note was received. The President stated that the note required no extended answer for "the Government has repeatedly and with entire candor stated the terms on which the United States would consider peace, and can and will entertain no proposal for a conference upon a matter concerning which it has made its position and purpose so plain."

Answers of a similar tenor, though in some cases more extended, were made by the members of the Entente, and the overture came to naught. Its receipt, however, was probably the moving cause of a notable address made by the President in the Metropolitan Opera House, New York, on Sept. 27, 1918. In this the President set forth what he called a "practical program" the salient points of which were as follows:

First.—The impartial justice meted out must involve no discrimination between those to whom we wish to be just and those to whom we do not wish to be just. It must be a justice that plays no favorites and knows no standard but the equal rights of the several peoples concerned;

Second.—No separate or special interest of any single nation or any group of nations can be made the basis of any part of the settlement which is not consistent with the common interest of all;

Third.—There can be no league or alliances or special covenants and understandings within the general and common family of the League of Nations;

Fourth.—And more specifically, there can be no special selfish economic combinations within the league and no employment of any form of economic boycott or exclusion, except as the power of economic penalty by exclusion from the markets of the world may be vested in the League of Nations itself as a means of discipline and control;

Fifth.—All international agreements and treaties of every kind must be made known in their entirety to the rest of the world.

This program was promptly seized upon by Austria as the basis of a new appeal which was made on Oct. 7, not to all belligerents this time, but to the President alone. It offered to conclude an immediate armistice on the basis of the fourteen points enunciated in the Presi-

dent's address to Congress on Jan. 8, the four points emphasized in his Feb. 1 speech and the program stated in the address in New York, Sept. 27. The substance of these three notable utterances have been given in the preceding pages.

This proposition was again refused. Events in the interim between the setting forth of these several points of view had changed the situation so that one at least of the fourteen points was no longer applicable. This was the tenth point, which had demanded the fullest possible autonomy for the peoples of Austria-Hungary. But by this time the independence, not autonomy alone, of Czecho-Slovakia had been recognized. Jugoslavia's claim also to a separate national existence had been approved by this Government.

One more attempt was made by Austria, now frantic and distracted, to secure terms. She willingly admitted the right of Czecho-Slovakia and Jugoslavia to independence and urged that immediate negotiations be initiated. She asked further that this might be done, irrespective of any correspondence that might be proceeding with any other power, the reference of course being to Germany.

By this time the fate of Austria had been sealed by the arbitrament of arms on the Italian front. There was no need of further correspondence with the doomed nation. Her note was transmitted to the Inter-Allied Conference at Versailles, and Austria was instructed to deal directly with the commander of the Italian forces.

Much more important than the Austrian peace overtures were those begun by Germany. That empire had at last abandoned all hope of military success. Her Macedonian front had crumbled, by the Kaiser's own admission; Turkey was threatened with absolute overthrow by the whirlwind campaign of Allenby; Austria-Hungary alone of all her allies was left, and could not maintain her own line, let alone render help to the hard-pressed German forces. The end was at hand, and it only remained for Germany to save as much as she could from the wreck of her military fortunes.

On Sept. 12, Vice-Chancellor von Payer had expressed the willingness of his Government to give back Belgium. Two days following the delivery of President Wilson's address of Sept. 27, the German Government began to set its official house in order, so that it might more fully conform to the President's views on popular government. The more conservative and war-insistent members of the Government were dismissed, and men of a more liberal character took their places. Changes were also made in the direction of ballot reform, looking for a more general participation by the people in the Government. The Constitution itself was changed, and the Cabinet Ministers were given the right to demand to be heard by the Reichstag. But the greatest change was made in the Chancellorship. Von Hertling, who was supposed to be persona non grata to the Allies because of his previous committals on questions connected with the war, was replaced on Oct. 2 by Prince Maximilian of Baden, who had no antagonisms to overcome and who was reputed to be of Liberal tendencies.

The first act of the new Chancellor after assuming office was to send to President Wilson through the Swiss Government as intermediary the following note:

The German Government requests the President of the United States to take in hand the restoration of peace, acquaint all the belligerent states with this request and invite them to send plenipotentiaries for the purpose of opening negotiations.

It accepts the program set forth by the President of the United States in his message to Congress on January 8, and in his later pronouncements, especially his speech of Sept. 27, as a basis for peace negotiations.

With a view to avoiding further bloodshed, the German Government requests the immediate conclusion of an armistice on land and water and in the air.

On the same day, the Chancellor outlined in a speech to the Reichstag the changes that had been made in the German administration and constitution. This was done evidently to convince the American Government that in any dealings it might henceforth have with Germany it would be dealing with a government of the German people, instead of a militaristic clique. The speech hinted also that Germany might be willing to pay an indemnity, and promised the complete restoration and rehabilitation of Belgium.

The reply of the President was despatched Oct 8. It neither accepted nor rejected the German offer, but rather deferred a positive statement pending the receipt of further information. The President declared that he would not feel at liberty to propose a cessation of arms to his associate powers until their soil had been evacuated by the German armies. He asked also whether the German note meant that the German Government actually accepted the terms that the President had set forth in his Jan. 8 address, and whether its object in entering into discussions would be only to agree upon the practical application

of those terms. Furthermore, the President wanted to know whether the Chancellor was speaking merely as the mouthpiece of the constituted authorities of the empire who had hitherto conducted the war. The answer to these questions the President declared was vital.

The answer of the German Government was quick in coming. It was dated Oct. 12, and bore the signature of Dr. Solf, the former Colonial Secretary, but for the preceding six days the Imperial Foreign Secretary. The note accepted unequivocally the President's address of Jan. 8 and his subsequent utterances as the bases of peace. It pointed out the changes that had been made in the German Government to bring it closer to the masses, and declared that the Chancellor spoke in the name of the German Government and the German people. As to evacuation, readiness was expressed to agree to this, and it was proposed that a mixed commission be appointed to consider the details.

In the interval between the receipt of the first and second note, Germany, with an almost unbelievable blindness, in view of the fact that she was suing for peace and that her interests lay in conciliating rather than exasperating her enemies, had committed fresh atrocities during her retreat through Belgium and had horrified the Allied and neutral nations by a submarine sinking resembling somewhat the tragedy of the "Lusitania." The British mail steamer "Leinster" had been torpedoed during a storm in the Irish Sea on Oct. 10 and had gone down in fifteen minutes with a loss of 480 lives, of which 135 were those of women and children.

These devastations and massacres strongly influenced the wording and tenor of the President's second reply. After stating that the matter of arranging the process of evacuation and conditions of an armistice must be left to the judgment of the military advisers of the United States and the Allied Governments, and emphasizing that there must be absolutely satisfactory safeguards and guarantees of the maintenance of the "present military supremacy of the armies of the United States and the Allies in the field," he gave a solemn warning that no proposition for an armistice would be considered as long as Germany persisted in her illegal and inhuman practices.

"At the very time that the German Government approaches the Government of the United States with proposals of peace, its submarines engaged in sinking passenger ships at sea, and not the ships alone, but the very boats in which the passengers and crews seek to make their way to safety, and in their present enforced withdrawal from Flanders and France, the German armies are pursuing a course of wanton destruction, which has always been regarded as in direct violation of the rules and practices of civilized warfare. Cities and villages, if not destroyed, are being stripped of what they contained not only, but often of their very inhabitants. The nations associated against Germany cannot be expected to agree to a cessation of arms, while acts of inhumanity, spoliation and desolation are being continued, which they justly look upon with horror and with burning hearts."

The President also directed the attention of the German Government to a sentence that occurred in his address at Mt. Vernon on the preceding July 4, in which as a term of peace was declared necessary, "the destruction of every arbitrary power everywhere that can separately, secretly and of its single choice disturb the peace of the world; or, if it cannot be presently destroyed, at least its reduction to virtual impotency." This, the President declared, was the kind of power that had hitherto controlled the German people. It was within the power of the German people to alter it, and the whole possibility of securing peace rested upon this being done.

The answer was thoroughly gratifying to this nation. There had been some dissatisfaction with the first reply, but this second one received the heartiest indorsement from all quarters. The Allied nations also gave it their warmest approval.

Germany's third note was dated Oct. 20, and was received in this country on the 22d. It denied the charges of atrocities, or declared that if severities had occurred, they were due to military necessity. It reiterated that the form of the German Government had radically changed, and that the proposals put forth were supported by the approval of an overwhelming majority of the German people. As regards the armistice, it suggested that the "actual standard of power" on both sides in the field was to form the basis for arrangements safeguarding and guaranteeing that standard.

The President's reply to this third note was sent the day after it was officially received. He declared his willingness to submit the proposal for an armistice to the associated powers, but warned Germany, that the only conditions he would feel justified in recommending would be such as would make the renewal of hostilities on the part of Germany impossible. If, moreover, the changes in the German Government were only nominal, not real, and if the United

States must deal with the military masters of Germany now, or if it is likely to have to deal with them later, "it must demand not peace negotiations but surrender."

The reply received prolonged consideration by the German authorities. By that time the military situation was so hopeless that nothing remained but submission. Ludendorff resigned his command on the 26th. On the 27th, a message to President Wilson, virtually accepted the terms by declaring that it awaited the receipt of the armistice proposition from the allied military staffs.

The ultimate compliance of Germany had been counted upon as absolutely foreshadowed by the progress of events, and terms had been drawn up while the correspondence was being interchanged. On Nov. 5, Secretary Lansing announced to the German Government that peace would be made on the terms prescribed in his public utterances by President Wilson. An important reservation was made, however, namely that liberty of action was reserved on the clause relating to the freedom of the seas, since it was liable to differing interpretations. It was also demanded that compensation be made by Germany "for all damage to the civilian population of the Allies by land, by sea, and from the air." The note closed with the statement that Marshal Foch had been authorized to receive the German delegates and acquaint them with the terms of armistice the Allied and Associated Powers were prepared to grant.

The Germans promptly requested the Marshal to appoint a time and place of meeting. The time was set as Nov. 7, and the place was the railroad car of Marshal Foch in the forest of Compiègne. The delegates proceeded there under a white flag. They were met at the French lines by guards, who conducted them to the place of meeting. There the armistice terms were read by the Generalissimo of the Allied armies. Their alleged severity aroused protests from the Germans, who were informed, however, that the Marshal's power to change them extended only to minor details. On Nov. 11, the German delegates affixed their signatures to the armistice terms, and the war was over. It is true that the treaty of peace remained to be signed, and this was not done until June 28, 1919, five years to a day from the date in 1914 when the assassination of the Austrian Archduke Ferdinand, at Sarajevo, had furnished the pretext for the World War. But the actual cessation of hostilities dates from Nov. 11, 1918. The terms of the armistice were such as to make it impossible for Germany to resume the war, even if she were so inclined. Those terms were drastic, but in the general judgment of the Allied world did not go beyond what justice and security from future aggression required.

In America, as in other Allied nations, the news that the armistice had been signed was received with joyful popular demonstrations. The relief from the strain of war was unspeakable, and with this was mingled pride at the part that America had played in bringing the war to a successful conclusion.

The terms of the armistice provided that three bridgeheads on the Rhine should be occupied by Allied forces. The Coblenz bridgehead was the one assigned to the American Army of Occupation. The march was begun almost at once, and on Dec. 12 the army reached Coblenz, their forces crossing the Rhine the following morning to occupy the bridgehead. Military administration was inaugurated at once, though the municipal authorities were allowed to function, under American supervision and control. The occupation continued until the signing of the Peace treaty, after which the American troops were gradually withdrawn and sent home, the places of some of them being taken by new units sent from America. In May, 1920, there remained about 13,000 American troops at the bridgehead under the command of Major-General Henry T. Allen. In the main, the occupation, beyond a little occasional friction, was marked by few untoward incidents, and order was well maintained.

The cessation of hostilities made it possible for the American people to become acquainted with the real extent of American participation in the conflict by various arms of the service. Previous to that time, many of the operations had been recorded in fragmentary form, or had been hidden under the veil of secrecy required by the censorship. The work of the land forces had been fairly well followed, but that of the navy and the air services had not been gauged at their full value. An official report of Secretary of the Navy Daniels, issued Dec. 3, 1918, gave interesting details of the navy's achievements.

On the day that war was declared the navy numbered 65,777 men. At the signing of the armistice, it had increased to 497,030. The ships in commission had increased in the same period from 197 to 2,003. Less than a month after war was declared, a division of United States destroyers was in European waters. By October, 1918, there were 338 ships of all classes serving abroad. Up to Nov. 1, 1918, of the total number of American troops in Europe, 924,578 had been car-

ried over in United States naval convoys, escorted by American cruisers and destroyers. Not one eastbound American transport was torpedoed or damaged by enemy submarines, and only three were sunk on the return voyage. In 10 months, the transportation service grew from 10 ships to a fleet of 321 cargo carrying vessels, with a dead-weight tonnage of 2,800,000.

A mine barrage had been laid in the North Sea for which 85,000 mines had been shipped abroad. The work of the destroyers in curbing the submarine menace was declared by the Secretary to have been without a precedent in Allied warfare and had received the most enthusiastic commendation of the Allied naval authorities. The work of the marines in the fighting at Château-Thierry, Belleau Wood, and many other battle fields has already been described in the foregoing pages.

Statistics of the main accomplishments of America in the two years between April 6, 1917, when war was declared, and April 6, 1919, are here subjoined:

April 6, 1917:	
Regular Army	127,588
National Guard in Federal Service	80,466
Reserve Corps in service	4,000
Total of soldiers	212,034
Personnel of Navy	65,777
Marine Corps	15,627
Total armed forces	293,438
Nov. 11, 1918:	
Army	3,764,000
Navy	497,030
Marine Corps	78,017
Total armed forces	4,339,047
Soldiers transported overseas	2,053,347
American troops in action, Nov. 11, 1918	1,338,169
Soldiers in camps in the United States, Nov. 11, 1918	1,700,000
Casualties, Army and Marine Corps, A. E. F.	282,311
Death rate per thousand, A. E. F.	.057
German prisoners taken	44,000
Americans decorated by British, French, Belgian, and Italian Armies, about	10,000
Number of men registered and classified under selective service law	23,700,000
Gas masks, extra canisters and horse masks	8,500,000

NAVY AND MERCHANT SHIPPING

Warships at beginning of war	197
Warships at end of war	2,003
Small boats built	800
Submarine chasers built	355
Merchant ships armed	2,500
Naval bases in European waters and the Azores	54
Shipbuilding yards (merchant marine) increased from 61 to more than 200.	
Cost of 32 National Army cantonments and National Guard camps	$179,629,497
Students enrolled in 500 S. A. T. C. camps	170,000
Officers commissioned from training camps (exclusive of universities, etc.)	80,000
Women engaged in Government war industries	2,000,000

BEHIND THE BATTLE LINES

Railway locomotives sent to France	967
Freight cars sent to France	13,174
Locomotives of foreign origin operated by A. E. F.	350
Cars of foreign origin operated by A. E. F.	973
Miles of standard gauge track laid in France	843
Warehouses, approximate area in square feet	23,000,000
Motor vehicles shipped to France	110,000

ARMS AND AMMUNITION

Persons employed in about 8,000 ordnance plants in the United States at signing of armistice.	4,000,000
Shoulder rifles made during war	2,500,000
Rounds of small arms ammunition	2,879,148,000
Machine guns and automatic rifles	181,662
High explosive shells	4,250,000
Gas shells	500,000
Shrapnel	7,250,000
Shipbuilding ways increased from 235 to more than 1,000.	
Ships delivered to Shipping Board by end of 1918	592
Deadweight tonnage of ships delivered	3,423,495

FINANCES OF THE WAR

Total cost, approximately	$24,620,000,000
Credits to 11 nations	8,841,657,000
Raised by taxation in 1918	3,694,000,000
Raised by Liberty Loans	14,000,000,000
War Savings Stamps to November, 1918	834,253,000
War relief gifts, estimated	4,000,000,000

Political Happenings During and After the World War. Congress passed, in 1915, another immigration bill with a literacy test. This was vetoed by the President. The Supreme Court, in June, 1915, decided against the Government in the dissolution suit against the steel trust and declared that the "grandfather clauses" of the Oklahoma and Maryland constitutions were void. The United States in September, 1915, undertook the supervision of the revenues of Haiti. A conference was called in October of that year of South American diplomats to consider the Mexican question. It was decided that Carranza should be recognized, and, on October 19, President Wilson recognized Carranza as heading the de facto Government of Mexico. In February, 1916, as a result of the failure to agree with the President's policy on national defense, Lindley M. Garrison, Secretary of War, resigned, and was succeeded by Newton D. Baker of Ohio. In January, 1915, Francisco Villa, the most powerful of the Mexican revolutionary leaders, killed several American miners and on March 9, with 500 followers, invaded the town of Columbus, New Mexico, killing seven troopers and

several citizens, destroying much property. He was pursued across the border by United States troops and on the following day the President authorized a punitive expedition to pursue and capture him. An agreement was made with President Carranza permitting this force to cross the border. General Pershing pursued Villa in the mountain regions of Chihuahua. Several Engagements were fought with the Mexicans. At Parral, American soldiers were attacked by natives and General Carranza demanded that the expedition be recalled. This was refused by President Wilson on the ground that the Mexican Government was not able to keep peace along the border. In spite of the protest of the Mexican authorities, the United States forces remained in Mexico, although Villa was not captured. The State Militia was called to protect the border. On July 15, after an exchange of notes, the matter was settled temporarily by a joint commission.

There were indications early in 1916 of a reunion between the Republican and Progressive parties, and this was verified by the announcement that their conventions would meet at the same time in the same city. A committee of prominent men of both parties was appointed to reach a common ground of agreement on both candidates and platform. At the convention, Charles E. Hughes, of New York, was nominated without serious opposition. Charles W. Fairbanks, of Indiana, was nominated for vice-president. At the Democratic convention held in St. Louis, in the early part of July, President Wilson was renominated by acclamation and Thomas R. Marshall was again nominated for vice-president. An element of the Progressive party nominated Mr. Roosevelt for president, but as he declined the nomination, the National Committee of the party indorsed Justice Hughes. The campaign was bitterly fought. Colonel Roosevelt took an active part in the support of Justice Hughes, and attacked the President's policies in regard to the war and Mexico in unsparing terms. The election in November proved one of the closest in the history of the United States. The first returns made it evident that Hughes had carried all the industrial and commercial States of the North and East, with the exception of Ohio. On the day following the election, it was announced that Mr. Hughes had been elected. Later in the day, however, gains from the West indicated the possibility of the re-election of the President. Many States which had been regarded as safely Republican, went Democratic. The turning point, however, was California. After a few days of suspense during the counting of the votes, the electoral vote of the State was announced for Wilson, and it was sufficient to re-elect him. The electoral vote stood 277 for Wilson and 254 for Hughes. The President's popular vote showed a gain of 2,000,000 over that of 1912, in spite of the fact that the Republicans gained in the House of Representatives and elected many of their State candidates. The legislation of 1917 was devoted chiefly to the successful conduct of the war. The measures passed, included those providing for the Emergency Fleet Corporation, food control, Federal regulation of coal, Trading with the Enemy Act, and like measures. On Oct. 24, 1918, President Wilson issued an appeal to the people of the United States to return a Democratic Congress in the coming fall election, declaring that the election of a Republican Congress would be taken abroad by Germany and the Allies alike as a repudiation of his leadership of policies. The Republicans resented this appeal, and the result of the election was a defeat for the administration. The Republicans secured a substantial majority in the House of Representatives and in the Senate by a close margin.

On the conclusion of the war, the nation quickly returned to a peace basis, and preparations were at once begun for the return of American soldiers. The first shipload of these arrived on Dec. 2, 1918, and they were followed by an ever increasing procession of vessels from Europe to the United States, bearing home the members of the American Expedition. It was announced on Nov. 18, 1918, that the President would personally attend the Peace Conference in Paris. The President, in his message, explained that as the Allies and Germany had made his speeches the basis of their negotiations, it was due to the American people, no less than to the Entente nations, that he should be in close touch with the deliberations. Accordingly, he embarked on Dec. 4, 1918, for France, accompanied by the American delegates, with a large group of experts. The peace delegates named by the President were Robert Lansing, Secretary of State; Henry White, formerly Ambassador to France; Edward M. House; and Tasker Bliss. The President was received with the greatest warmth in Paris, as well as in Great Britain and Italy, which he visited previous to the formal meetings of the Conference.

The chief concern of President Wilson at the Peace Conference was avowedly the preparation of the covenant of the League of Nations, and to this object he

devoted his chief efforts. The draft of the covenant was cabled to the United States, prior to the return of the President for a brief visit. He arrived in Boston on February 24. Opposition to the covenant had already developed, chiefly from a group of Republican Senators, who asserted that it violated the sovereignty of the United States and repudiated the Monroe Doctrine. The chief article singled out for attack was Article 10, which pledged the United States "to preserve, as against external aggressions, the territorial integrity of all the States in the League." President Wilson returned to Paris early in March, after having delivered several speeches in support of the Treaty of the Covenant. On the signing of the Treaty on June 28, 1919, the President at once embarked for the United States, arriving on July 9.

On July 1, 1919, the prohibition of the sale of intoxicating liquors went into effect in the United States, as a result of the ratification of the 19th amendment to the Constitution by three-fourths of the States. By the terms of the provisions, however, the amendment was not effective until January, 1920.

The Peace Treaty was considered by the Committee on Foreign Relations in the Senate, and on the report of the committee on September 28, it was found to contain 38 amendments and four reservations. The amendments were rejected and the chief interest centered upon the reservations. These, in the main, covered the same ground as the amendments. The first provided that the United States should have the right to withdraw from the League of Nations "upon a notice provided in Article I of said Treaty of Peace with Germany." The second reservation absolved the United States from any obligation in Article 10 "to preserve the territorial integrity or political independence of any other country." The third reservation provided that the United States should have a right to decide what questions were within its domestic jurisdiction. In the fourth reservation, the United States declined to submit for arbitration or inquiry any questions depending on, or related to, the Monroe Doctrine." These reservations were debated in the Senate. The Treaty was defeated with the reservations, by a vote of 55 to 39, and without the reservations, by a vote of 55 to 38. No further consideration of the Treaty was given during the remainder of this session of Congress. On April 30, Senator Knox introduced a resolution providing for a declaration of peace with Germany. This resolution was adopted by both the House and the Senate on May 27, 1920, but was vetoed by the President.

Congress passed a comprehensive bill for the conduct and regulation of railroads. (See RAILWAYS.) Various measures were taken during December, 1919, and the following months for the suppression of anarchistic and communistic propaganda in the United States. Raids were made upon the headquarters of radical societies throughout the country, and many of the leaders were taken for the purpose of deportation. In December, about 300 anarchists, the most conspicuous of whom were Emma Goldman and Alexander Berkman, were deported to Russia.

Affairs in Mexico gave rise to an exchange of notes between that country and the United States, during the latter part of 1919. During the same period there were serious labor troubles. A general coal strike in bituminous fields was prevented only by the prompt action of the Government by declaring the strike illegal, and issued an injunction preventing the leaders from ordering a strike. A commission was appointed by the President in December to reconcile the differences between the employees and the employers. The railroads also assumed a threatening attitude, but these difficulties were temporarily reconciled pending the passage of railroad legislation in Congress. Several radical measures, the most important of which was the so-called Plumb Bill, were advanced by railroad employees and their representatives. This measure practically gave the railroads of the country into the hands of the employees.

On Feb. 13, 1920, Robert L. Lansing resigned as Secretary of State, as a result of severe criticism on the part of President Wilson of his conduct in summoning the cabinet during the President's illness. He was succeeded by Bainbridge Colby of New Jersey.

The presidential campaign of 1920 had for its chief issue the League of Nations. President Wilson, during the consideration of the measure in the Senate, had made an extensive tour of the country, which was ended only by a physical breakdown that for many months prevented his active participation in the affairs of the Government, and left him practically an invalid. The leading Republican candidates, prior to the convention, were General Leonard Wood; Governor Lowden, of Illinois; Senator Hiram Johnson, of California; and Herbert Hoover. The most conspicuous Democratic candidates were William G. McAdoo and Governor James M. Cox of Ohio. Preferential primary elections were held in the various States during April. The Republican national campaign opened at Chicago, on June 8.

The deadlock between General Wood and Governor Lowden ended on January 12 by the nomination of Senator Warren G. Harding, of Ohio, for president, and Governor Calvin Coolidge of Massachusetts for vice-president. At the Democratic National convention, which opened in San Francisco on June 28, James M. Cox was nominated for president on the 44th ballot, and on the following day Franklin D. Roosevelt of New York was nominated vice-president. On July 10, a Committee of 48 met in Chicago to form a third party, called the Farmer-Labor party. On July 10, Parley P. Christensen of Utah was nominated for president, and Max F. Hayes for vice-president.

The election campaign which followed the nominations was aggressively carried on on both sides. Harding made no campaign tour, but remained at his home in Marion, Ohio, where he addressed delegations from day to day. James M. Cox, the Democratic nominee, took an extremely active part in the campaign, making speeches in practically every State. The chief avowed issue on the part of the Democrats was the League of Nations. The Republicans, however, devoted most of their attacks to the administration of President Wilson. In the election on November 2, Harding received 16,091,804 popular votes, and Cox 9,014,667. Harding and Coolidge received 404 electoral votes, and Cox and Roosevelt 127. The Republican candidates received the largest popular and electoral majority ever cast. The Democrats carried only 11 Southern States, losing Tennessee. The Congress elections gave the Republicans 307 members in the House, and the Democrats 127. The Republicans gained 10 seats in the Senate, giving them a majority of 22. The Woman Suffrage Amendment having been adopted prior to the election, women participated for the first time throughout the country. Following the election, Senator Harding remained at his home at Marion, with the exception of several brief trips for recreation. He announced on December 16 that Vice-President Coolidge would occupy a seat in the cabinet. During the period between his election and his inauguration, Mr. Harding gave chief attention to the selection of a cabinet and to conferences with prominent Republican leaders. The cabinet was not announced until the inauguration. It was as follows: Secretary of State, Charles E. Hughes, of New York; Secretary of the Treasury, Andrew W. Mellon, of Pennsylvania; Secretary of War, John W. Weeks, of Massachusetts; Secretary of the Navy, Edwin C. Denby, of Michigan; Secretary of the Interior, Albert B. Fall, of Mexico; Postmaster General, Will H. Hays, of Ohio; Attorney-General, Harry M. Daugherty, of Ohio; Secretary of Agriculture, Henry C. Wallace, of Iowa; Secretary of Commerce, Herbert Hoover, of California; and Secretary of Labor, James J. Davis, of Pennsylvania. The inauguration took place on March 4, 1921, with a simple and dignified demonstration. On March 23 the President issued a call for a special session of Congress, to be held on April 11, 1921.

UNITED STATES CHRISTIAN COMMISSION, an organization founded by the National Young Men's Christian Association to perform religious and charitable work among the Union forces during the Civil War. It was first suggested by Vincent Colyer, who immediately after the battle of Bull Run, in July, 1861, went to Washington to do Christian work in the hospitals and camps in and around that city. His suggestion that a society similar to the United States Sanitary Commission be organized by the Young Men's Christian Associations of the country was acted upon by a convention called for the purpose in New York City, Nov. 14, 1861. The United States Christian Commission was then formed, and George H. Stuart, of Philadelphia, was elected president. The work of the commission was mainly moral and religious; but while it circulated Bibles, books, leaflets, etc., in camps, ships, and hospitals, it also distributed much food, clothing, hospital stores, and delicacies. Like the Sanitary Commission, it followed in the wake of the great armies, and gave efficient aid to the army and navy chaplains in throwing Christian influence around soldiers and sailors. In its benevolent work, the commission expended over $6,000,000, most of which was collected by the women in the different religious denominations.

UNITED STATES COAST SURVEY. See COAST AND GEODETIC SURVEY, UNITED STATES.

UNITED STATES MILITARY ACADEMY, a school for the practical and theoretic education of officers for the military service of the United States. The present academy at West Point was opened in 1802. From that time until November, 1918, 6,539 cadets were graduated. In the latter year, two classes were graduated before the normal time, on account of the necessity for more officers. Provision was made by Congress for larger membership of classes. There were in 1920, 735 cadets and 156 teachers. During recent years a number of new buildings have been erected. The superintendent in 1921

was Brigadier-General Douglas MacArthur.

UNITED STATES NATIONAL MUSEUM, a collection of objects of scientific and historical interest constituting a part of the Smithsonian Institution in Washington, D. C. The collection had its origin in a collection of minerals and other similar objects kept in a few cabinets by Smithson, which he later turned over to the Government. The present name was first adopted in 1876. Three years later Congress appropriated $4,000,000 for a building to house the collection, which had rapidly grown on account of the contributions in specimens made by Government surveys and exploring parties. The collection is especially rich in exhibits illustrating the industries and customs of the American Indian tribes and the fisheries of the United States. In 1913 Congress appropriated another $3,500,000 for enlarging both housing accommodations and the collections of the Museum.

UNITED STATES NAVAL ACADEMY, a school for the education of officers of the United States Navy, at Annapolis, Md. It was founded in 1845. There were, in 1920, 1,803 midshipmen and 245 instructors. During the war period, the course of instruction was reduced from four to three years, but in October, 1919, the four-year course was resumed by the three lower classes. Many new buildings have been added to the campus in recent years. Among these is the Navigation and Seamanship building, erected in 1921. The superintendent in that year was Rear-Admiral A. H. Scales.

UNITED STATES SHIPPING BOARD, created by one of the many emergency war measures passed by Congress shortly after the declaration of war against Germany, in April, 1917, to take over and operate merchant shipping and to build new ships for overseas transportation. By the end of the year the Board had taken over 132 shipyards, in which cargo ships exclusively were being built. For this work Congress had appropriated $1,135,000,000, which, however, included the appropriation for the Emergency Fleet Corporation, subordinate to the Shipping Board. Aside from its program of vast shipbuilding the Shipping Board also had power to take over any American merchant ship suitable to the war needs of the emergency. In the beginning of 1918 the Board secured a further appropriation of $800,000,000, bringing the total up to $2,100,000,000.

UNIVERSALIST CHURCH, a communion holding the doctrine that all men, and also the devil and fallen angels, will be forgiven and will enjoy eternal happiness. This belief is very ancient, and passages implying it may be found in the works of Origen and his followers, Gregory of Nyssa, Chrysostom, etc. It is also said to have constituted part of the creed of the Lollards, Albigenses, and Waldenses.

Among the English divines who have held some form of this doctrine are Tillotson, Burnet, and William Law, and more recently the late Professor F. D. Maurice. All Unitarians hold it, and some of the Universalists agree with the Unitarians in rejecting the doctrine of the Trinity. The Universalists ground their reasons for their doctrine in the love of God, who, they say, is only angry with sin, not the sinner, and therefore if the sinner repents even after death his repentance will restore him to God's favor. The sovereignty of God will be finally vindicated by the ultimate harmony of the moral universe, and the submission of all things in heaven and earth to His righteous will. When righteousness is triumphant peace and happiness will prevail; till then pain and suffering will be instruments to work out the will of God. They profess to prove their doctrine from Scripture, quoting in support of it Matt. xxv: 46, John xvii: 3, I Cor. xv: 22, Phil. ii: 10, Eph. i: 10, Col. i: 19, 20, and I Tim. iv: 10. Universalism is better known as a distinct sect in the United States than in England. In 1827 a division arose among the American Universalists concerning punishment after death, some asserting it to be limited, while others denied it altogether. Some separated from the main body and called themselves "The Massachusetts Association of Restorationists." Most of them afterward joined the Free-Will Baptists or the Unitarians, while the others returned to the main body. In 1840 the whole sect divided into two, the Impartialists and the Restorationists. But Universalism is also held by many members of other sects, and practically by all Theists strictly so called. See UNITARIAN CHURCH.

UNIVERSAL LANGUAGE, the ideal of the ultra-internationalists, who desire a medium of vocal intercourse between the peoples of all nations and countries. In diplomatic circles French has largely held this position for the past hundred years, while in European commercial circles German has been the most common means of intercourse, while English holds first place in the Far East. Certain

groups of idealists, however, contend that there should be a language which, if it does not quite become the native tongue of all peoples, should at least be universally taught and so widely known that intercourse between peoples would become practically as free as in any single country. To supply this want artificial languages have been created, one of the first of which was Volapük. More recently a more perfected system was created, known as Esperanto, whose vocabulary is made up of a mixture of the Latin languages, English and German. This language may be learned with greater ease than any of the national forms of speech and is now more or less fluently spoken by millions of people in all parts of the world. In 1920 it was adopted as the official international language of the Russian Soviet Government, which has made it one of the studies in the schools of Russia.

UNIVERSITIES, AMERICAN. There is no accepted definition of the term "university" in America. Our earliest colonial institutions were founded as schools or colleges. The Constitution of Massachusetts of 1780 uses this language: "Harvard College, in which University many persons" have been educated. This identification of the terms college and university is not yet obsolete. The name of Yale College was changed to Yale University in 1886. The College of New Jersey became Princeton University in 1896. The state institutions in earliest days beginning with North Carolina, Georgia, and South Carolina generally used the title university without any real discrimination in work.

Within the past fifty years the American University has assumed a more definite form and type. This type differs essentially from that of the historic English Universities and equally so from those of Germany. The American University has in general been developed out of the American College, and it still includes the college as a part of its organization. So Harvard College is a branch or department of Harvard University. Adelbert College is a part of Western Reserve University. A university is therefore a college plus something more. This something more includes: (1) provision for graduate work leading to the Ph. D. degree; (2) extended facilities for research; (3) additional schools co-ordinate with the college or built upon the same for professional work of high character. Medicine, Law, and Engineering in its most varied forms are the professions most frequently provided for, though others are sometimes added. It is the development of these three characteristics that has made the American University.

Graduate Work.—The first announcement of courses leading to the degree of Ph. D. was made by Yale College in 1860. Harvard followed in 1872. The opening of Johns Hopkins University in 1876 marks an epoch in this field. In that year there were only 269 graduate students in all American institutions. Ten years later the number had increased to 1,237 and in ten years more to 5,000. The influence of this movement affected richer and older institutions so that generous provisions for graduate work were made in many of them. The degree of Ph. D. is now regularly conferred on a considerable number of candidates by twenty or twenty-five institutions which by this token may be called universities. Of course there are others doing a creditable amount of graduate work, especially for the Master's degree, but they do not compete in number and variety of courses offered with the first group.

The requirements for the Doctor's degree are fairly uniform. To the ordinary college course at least three years of work is added. This work is highly specialized, and culminates in a dissertation, which is generally printed and must give evidence of ability to do independent investigation. Preliminary acquaintance with French and German is demanded, also a familiarity with the literature of the subject under investigation. An examination, oral or written, covers the whole field of study.

Facilities for Research.—These must necessarily accompany all graduate work. A university must therefore have well equipped laboratories and extensive libraries. Of course such facilities are demanded even for undergraduate work, but the true university provides them on a scale and to an extent that cannot be demanded even of the best college. Teachers of university students must also be left free for independent investigations. Under the influence of the National Research Council an effort is now being made to stimulate research in all American institutions of high grade, but the universities must lead the way. Connected with research work provision must also be made for publication of results.

It was not accidental that Johns Hopkins University became the center from which issued important publications in so many fields.

Professional Training.—Universities are not only well equipped institutions for specialized graduate study, but they are generally big institutions, with oppor-

tunities for study in the broadest fields. They have thousands of students, immense resources, provided either by taxation or endowment, many buildings and extensive grounds. Even the college course in such an institution represents the extreme movement for widening the curriculum. Admission is on liberal terms, and the widest possible choice of subjects is afterward allowed. In the same spirit professional schools are a part of the university and share its care and its fortunes. The tendency in recent years has been to bring schools of medicine and law into close affiliation with great universities. This result has come about in part from increased requirements in these schools. Universities have likewise developed schools of applied science or technology parallel with the college course or supplementary thereto. Year by year vocational work is elevated and elaborated into degree courses. Thus we find not only new courses in engineering, but also in architecture, industrial art, forestry, commerce, journalism etc.

In connection with this expansion of the curriculum might be mentioned the strong tendency of American universities to extend their facilities to the larger public outside their walls. (See article on University Extension.)

Types of American Universities.—The name "university" was originally preferred to that of college by institutions founded directly by the States, and today the State universities form the most distinctive type of higher educational institutions. The territory of the Middle West afforded the best field for this development. Some of the strongest of these institutions owe their origin or their rapid growth to the Morrill Act passed by Congress in 1862 for the promotion of agriculture and the mechanical arts. These great State universities of the Middle West and California answer in every way the tests laid down above. They are liberally supported by the States, a number of them having an annual appropriation of more than one million dollars for expenses. They have a large and rapidly growing student body and are doing an increasing proportion of the educational work of the country. While they do not at present surpass several of the strongest universities on private foundation in number of higher degrees given, they show unusual eminence in public service, in contributions to the material welfare of the States, in the utilization of knowledge, especially scientific knowledge, for the improvement of social and economic conditions. These words of praise do not apply to all State universities. Many of them fall short of the standards laid down, but they are improving as rapidly as funds are provided and in general more rapidly than endowed institutions.

The oldest American universities had the support at various times of public taxation, of denominational patronage and of private endowment. Gradually they have been left to the last named source of help. Nowhere else in the world has private philanthropy accomplished so much as in the United States for educational development. The number and strength of these institutions in the Eastern States has prevented the upbuilding of State universities in that section. In other sections, too, private institutions are growing in resources and power, and occasionally new ones are founded. The University of Chicago and Leland Stanford Junior University were at their very birth dedicated to great careers.

Strictly denominational universities are less strong relatively than in the past, but are loyally supported and defended by their adherents. As a rule they approach in manner of organization and in temper of work the endowed universities above described.

A new type of institution has recently come into notice known as "The Urban University." Some of this type are merely endowed universities which, being located in large cities, assume certain duties of local leadership, natural and proper. Others, however, are real "municipal universities" supported by city taxes and forming the culmination of the city school system.

The conclusion reached from this study is that the American University has a real existence but is still somewhat nebulous. No register of names can yet be made. No legislation, State or national, guards the title. The U. S. Bureau of Education does not help us, for it publishes a list of approximately 600 higher institutions, including colleges, universities, and technological schools. Voluntary organizations do not solve the problem. Universities and institutions of less rank are found in the various associations which are organized according to type, not standard, as for example, The National Association of State Universities, The Association of American Universities, The Association of Urban Universities, or The Association of American Colleges. And yet through the cloud the American University is emerging, mighty in its achievements, the hope and the prophecy of national greatness. See UNIVERSITIES, AMERICAN; TECHNICAL EDUCATION; UNIVERSITY EXTENSION, etc.

UNIVERSITY COLLEGE, a college or teaching institution belonging to a university, or such as might belong to a university. The University College, London, is closely connected with London University. The name is given especially to three of the four colleges which are intended to form a Welsh University, viz., the University College of Wales at Aberystwith, University College of South Wales at Cardiff, and the University College of North Wales at Bangor. The students of these colleges, proceeding to degrees, have to go through a course at either London, Dublin, Edinburgh, or Glasgow. At Dundee there is also a university college now connected with St. Andrews University.

UNIVERSITY COLLEGE, OXFORD, the oldest in the university, founded about 1249, though the exact date of its foundation is doubtful. Its first statutes date from 1280.

UNIVERSITY EXTENSION. The term "university extension" was originally applied to a movement designed to extend university instruction beyond campus limits, or as was sometimes said to "carry the university to the people." It made the college campus co-extensive with the State and enlarged the student body by the admission of thousands seeking the benefits of special training or general culture. The movement has been fostered from both sides. It is a part of the impulse toward universal education. It suggests also a new interpretation of university service, rendered not to the privileged few but to a larger group.

The work of the university extension has with passing years been greatly expanded. The university is not only a seat of learning, but a great laboratory or research bureau. With this comes the call to apply this new knowledge to life, to make the hidden treasures of learning immediately available as the current coin of world exchange.

There has also been a growth in the various agencies that do this work. So true is this that the term university extension is giving place to educational extension or some similar phrase denoting its wider content.

The system of extension lectures was developed by English universities from 1867 on through the influence of Prof. James Stuart of Cambridge. In 1872-1873 Cambridge University instituted extension work in many towns of England. In 1876 was founded the London Society for Extension of University Teaching. In 1885 the University of Oxford put into operation its Delegacy for Extension of Teaching Beyond the Limits of the University. An address before the American Library Association in 1887 resulted in beginning similar work in Buffalo, Chicago and St. Louis under the auspices of the city library. Previous to this the Chautauqua movement was spreading and instruction was offered through summer schools, reading circles, or correspondence study. In 1890 the American Society for the Extension of University Teaching was organized in Philadelphia. In 1891 New York made the first State appropriation ($10,000) for extension work. In 1892 the University of Chicago took up extension work as a serious task. Columbia University had already made some beginnings, and that same year (1892) extension work was begun by the University of Wisconsin. These three institutions have continued to lead in developing all phases of extension work. In 1915 the National University Extension Association was organized. In 1918 a Federal Division of Extension Service was established as an emergency measure by order of the President and was maintained for six months. Following this, in 1919, the extension divisions of the State universities effected the incorporation of the National University Extension Association, which has offices in Washington and mediates between the Bureau of Education and the State divisions of extension work. This association maintains an executive secretary and is active in preparing bulletins on all phases of extension work.

Methods of Work. 1. *Classes.*—Extension classes are only slight deviations from regular curriculum work. In subject matter and method they sometimes duplicate college courses. Sometimes they are arranged for special needs. Short courses are provided for busy men and women. These classes may be held at or near the university, or in distant centers.

2. *Lectures.*—These may be technical or popular, formal or informal. They sometimes supplement private study or group study. It was from this point that extension work had its early beginnings.

3. *Club Study.*—In this way groups of workers get together at intervals for conference and discussion. Their work is ordered by printed leaflets, instruction guides and bibliographies.

4. *Correspondence Study.*—This is extension work brought to the individual. Questions are prepared on assigned topics, answers are written and papers sent in are corrected and graded. This method of work is especially suitable for credit courses.

5. *Public Service.*—This is rendered through public discussion. It differs from lectures. It establishes forums, community institutions and the like. Its

work is to arouse and inform public opinion.

6. *Package Libraries.*—These are made up of selected books and pamphlets, changed as needful, and sent on request to libraries, clubs, schools, and individuals. Some institutions treat as many as 1,000 subjects in this manner.

7. *Visual Instruction.*—This is carried out through pictures, lantern slides, or films furnished for motion picture machines. Sometimes exhibits of actual material or machines are lent to schools or clubs for inspection and study.

Besides the above there are still other methods of work which have independent features or combine those already mentioned. Such are bureaus or divisions for Municipal Information, Business Service, General Information, Lyceum Service, Community Entertainment, etc.

Extension work of one kind or another is now offered by 127 educational institutions. This takes no account of private commercial schools operated for profit, of various clubs, societies, and other organizations that are doing extension work of many kinds. Some of the educational institutions above referred to offer only one form of work, as extension classes, or correspondence study; others offer every possible form. The great State universities have taken the lead, but the work done by a few private foundations, as Columbia University and the University of Chicago, is equally notable.

Accurate figures are of course not available but, according to figures of Dr. Schlicher, published by the National University Extension Association in 1919, it is estimated that university extension is reaching about 120,000 students through classes or correspondence study; 2,026,000 through semi-popular lectures; 5,553,000 through pictures; 308,000 through institutes and conferences; 936,000 through outlines and pamphlets used in debates and discussions; 1,265,000 through bulletins and circulars.

Dr. W. S. Bittner in a bulletin published by the U. S. Bureau of Education, (1919 No. 84) calls attention to the fact that during the World War much of the machinery and devices used to mold public opinion, to teach soldiers and sailors or industrial workers, was taken from the university extension movement.

Extension lecture bureaus were called into immediate service to spread war propaganda. Similar service was rendered in support of Liberty Loans, Red Cross Drives, and other war interests. Universities used without stint available resources for what might be called extension courses in practical subjects, as automobile mechanics, food conservation, nursing, war aims, etc. The same plan of work was put into operation in training camps, and for this men were taken freely from colleges and universities.

The rapid spread of extension work within the recent past shows that this is too wide a field to be adequately cultivated by private initiative. It belongs to the State and special machinery should be set up by legislative action. Unified management and a common program should be agreed on. Only in this way can extension work be provided sufficient to meet the demands of a new age and a rapidly increasing population.

UNIVERSITY SETTLEMENTS, houses in the poor districts of cities where educated men and women live and come in contact with the working classes for social, educational, and civic purposes. These settlements provide clubs, and offer a home and recreation for wage-earners.

The idea of the university settlement grew out of the London establishment of the Working Men's College in 1860. An Oxford graduate, Edward Denison, in 1867, was the first to make a real home among the poor. He lived but a short time, leaving his work when it was still an experiment; but out of his idea of the social elevation of the poor grew a great work—resulting in the establishment of TOYNBEE HALL (*q. v.*), so called after Arnold Toynbee, who in 1875 worked among the poor of Whitechapel. A memorial was built to him, due to the influence of Samuel A. Barnett. Various settlements were started in London and in several cities in Scotland.

The first settlement in the United States was founded in New York City, Sept. 1, 1889, by the graduates of several women's colleges. It was located in one of the most crowded tenement districts of the East Side. In the same month a settlement called Hull House was opened in Chicago. On May 14, 1891, another settlement was organized in New York by the graduates of Yale, Columbia, Princeton, and other universities. In October of the same year the graduates of Andover Theological Seminary and other ex-collegians began a similar work in the tenement district of Boston. There are settlements, besides those mentioned, in Brooklyn, Buffalo, Jersey City, Hartford, Philadelphia, Cleveland, Cincinnati, Pittsburgh, St. Louis, San Francisco, and many other cities; numbering altogether nearly 100. In 1891 the College Settlements Association was formed, with the purpose of uniting all college women and their friends, who were interested in settlement work. Hull House, in Chicago, under the leadership of Jane Addams,

is one of the most widely known of University Settlements.

UNTERMEYER, LOUIS, an American author, born in New York, in 1885. He was educated at De Witt Clinton High School, New York, and at the age of 17 entered his father's business of jewelry manufacturing. Although being actively and successively engaged in this business, he became one of the most prominent humor poets in the United States. He was a contributing editor to the "Liberator," an occasional lecturer at Yale, Princeton, and other colleges, and a member of the Socialist party. Besides contributing many criticisms and reviews to the "New Republic" "Yale Review," New York "Evening Post," etc., he translated a compilation of "Poems of Heinrich Heine" (1917); "Modern American Verse" (1919); and wrote "The Younger Quire" (1910); "First Love" (1911); "Challenge" (1914); and "Other Poets" (1916); "Three Times" (1917); "Including Horace" (1919); etc.

UNTERMYER, SAMUEL, an American lawyer, born at Lynchburg, Va., in 1858. He was educated at the College of the City of New York and at Columbia University, was admitted to the bar in 1879, eventually becoming a member of the firm of Guggenheimer, Untermyer, and Marshall. He organized and was counsel for many industrial and railway corporations and became especially well known for his successful efforts in reorganization, as well as for his successful merger of some of the largest copper companies in this country. He also acted as lawyer for many prominent individuals. His service as counsel for the Committee of Banking and Currency of the House of Representatives in the "Pujo Money Trust Investigation" resulted in the enactment of improved remedial laws. During the World War he acted as special adviser to the Government on the interpretation of income tax and war emergency tax laws and assisted the Provost Marshal General in the administration of the Selective Service Law. In 1919 he became special counsel to the Joint Committee of the New York Legislature, investigating the building and housing conditions in New York City, and succeeded in unearthing serious scandals and in indicting a large number of individuals and corporations. He was known as an advocate of public ownership of public utilities and of a national corporations law. He was a delegate to the Democratic National Conventions in 1904, 1908, 1912, and 1916. Besides acting as executor and trustee of many large estates, he was a member of the United States Section of the International High Commission, a member of many legal societies and an officer of the New York State Industrial Farm Colony and of the Andrew Freedman Home.

UNTERWALDEN, one of the four "Forest Cantons" of Switzerland, forms part of the hill country which surrounds the Lake of Lucerne; area, 295 square miles; pop. about 33,000. Unterwalden is divided into two parts, Upper and Lower; the capital of the Nidwald is Stanz, and of the Obwald Sarnen.

UPANISHADS, in Hindu sacred literature, the name given to the Vedic speculative treatises which were full of attempts to solve problems connected with the universe and the nature and destiny of man. They are 108 or more in number, each Veda having a certain number of upanishads connected with it. They constitute part of the Brahmanas or commentaries belonging to the Veda, presenting the Vedic doctrine in a comprehensive form, and being of a more dogmatic character than the rest of the Brahmanas. They vary in date like the Brahmanas, which extend, according to Max Müller, from 800 to 600 B. C. All Indian philosophers and various sects profess to derive their belief from the upanishads.

UPAS TREE, the *Antiaris toxicaria*, a large tree growing in Java. Stem naked for the first 60, 70, or 80 feet of its height; leaves alternate, stipulate, entire, unequal-sided, subcordate, costately-veined; flowers in axillary or lateral drooping peduncles, monœcious; males numerous, inclosed in a hairy involucre calyx with three or four divisions, anthers sessile, three or four; females solitary, calyx in several divisions with a long bipartite style, and ultimately bearing a succulent drupaceous fruit. The inspissated juice of the upas tree constitutes a virulent poison called by the natives antjar, which owes its deleterious character to the presence of strychnine. The smallest wound by an arrow tipped with this poison is fatal. Toward the close of the 18th century a Dutch surgeon, Foersch, circulated in Europe various myths with regard to the upas tree. It was said to be so deadly that the poison was collected by criminals condemned to death, who obtained their pardon if they brought away the poison which was, however, found fatal to 18 out of every 20 who made the attempt. It was destructive to all vegetable life but its own, and grew in the midst of a desert which it had made. It is now known that the upas tree was credited with the destruction of animal life really attributable to

the escape of carbon dioxide from a vent or vents in a valley surrounded by volcanoes. It has been seen growing with other trees in forests, and in 1844 was introduced into foreign hothouses with no deleterious effect.

UPOLU, one of the richest and most beautiful of the islands of the Pacific, belongs to the Samoan group, lying about 60 miles W. of Tutuila. It is 140 miles in circumference, and has about 16,000 inhabitants. The island has been a mission station for many years. It was awarded to Great Britain by the Treaty of Versailles. Many of the inhabitants are Christians. The chief harbor is Apia. Coffee and cotton are cultivated. The principal article of export is cocoanut oil.

UPPER SENEGAL AND NIGER, a French colonial possession in west Africa, formed in 1904 from the territories of Senegal and the Niger, acquired in 1893. It extends from the southern boundaries of Algeria to the frontiers of Dahomey, Togoland, the Gold Coast and the Ivory Coast, with the military colony of the Niger to eastward and Mauritania, the Faleme river and French Guinea to the westward. It is over half a million square miles in area, the character of the country being largely rolling plateaus, capable of being extensively developed agriculturally. It is watered by about two-thirds of the Niger. The population is about 5,600,000, of which 1,300 only are white.

UPSALA, the historic center of ancient Sweden, the principal and last stronghold of heathenism in that country, and still one of the most important towns in Sweden, stands on a little stream that runs down to Lake Mälar, 41 miles N. by W. of Stockholm. Its existing importance is due to its being the seat of the primate, the only archbishop of the Swedish church, and of the principal university. The cathedral, built of brick in the Gothic style was founded in 1289, completed in 1435, partly burned down in 1702, and only partly restored since that disaster. It contains the tomb of Linnæus, and those of Gustavus Vasa and some other Swedish kings. The university, founded in 1477, though new buildings were erected in 1877, is attended by 1,500 students, and possesses a library (1620) of over 400,000 volumes and 10,000 MSS., an observatory, botanical garden, and various scientific collections. In the older town, around which on the E. and N. new suburbs have been built, there stands the castle of Gustavus Vasa (1548). Pop. about 27,500. About 3 miles to the N. E. lies Old Upsala, where are three vast tumuli of the ancient legendary kings; and about 4 miles to the S. E. are the Mora stones, on which the old kings used to take the oath of good governance.

UPSHUR, ABEL PARKER, an American statesman; born in Northampton co., Va., June 17, 1790; was admitted to the bar in 1810; practiced at Richmond, Va., till 1824; became a member of the legislature in 1825; judge of the General Court of Virginia in 1826; delegate to the convention to revise the State constitution in 1829; and after the reorganization of the judicial system under that instrument was again elected judge of the same court. This position he continued to hold till 1841, when he was appointed Secretary of the Navy by President Tyler. Two years later, on the resignation of Daniel Webster, he was appointed Secretary of State. Early in 1844 he was on the United States Steamer "Princeton," on the Potomac river, in company with the President and other members of the cabinet, to witness experiments with a large wrought-iron gun which burst, and mortally wounded him together with several others. He died near Washington, D. C., Feb. 28, 1844.

UPTON, EMORY, an American military officer; born in Batavia, N. Y.; Aug. 27, 1839; was graduated at the United States Military Academy in May, 1861, and was commissioned 2d lieutenant in the 4th artillery; and a few days later was promoted 1st lieutenant of the 5th artillery. He participated in the battle of Bull Run and in the Peninsula Campaign early in 1862. In October of that year he was commissioned colonel of the 121st New York Volunteers. He distinguished himself at the battle of Rappahannock Station, Va., in November, 1863, and especially at Spottsylvania, where he was wounded while leading the 12 attacking regiments of his corps. For this gallantry in the latter action he was promoted Brigadier-General of volunteers and brevetted lieutenant-colonel, U. S. A. He later participated in the Shenandoah Campaign, and won distinction at Winchester, Va., for which he was brevetted Major-General of volunteers. In March, 1865, he was brevetted Major-General, U. S. A., was promoted Lieutenant-Colonel, U. S. A., in July, 1866. He originated a system of military tactics which was adopted by the Government in 1867; was superintendent of the United States Military Academy in 1870-1875; and was promoted colonel, U. S. A., in 1880, and was assigned to the 4th artillery in San Francisco, Cal. His publications include: "A

New System of Infantry Tactics" (1867); "Tactics for Non-Military Bodies" (1870); "The Armies of Asia and Europe" (1878); and "The Military Policy of the United States." He died in San Francisco, Cal., March 14, 1881.

URAL, a river of Russia; rises on the E. side of the Urals in the province of Orenburg, and runs mainly S. for 1,400 miles, into the Caspian sea, being practically the boundary between Europe and Asia. It gives name to a province, Uralsk, which lies mainly E. of the river and N. of the Caspian, belonging to the Steppe region and to the "Kirghiz provinces" included in Asiatic Russia.

URAL MOUNTAINS, the longest chain of mountains running N. and S. in the Old World, extending for 1,970 miles from the deep basin of the Caspian and Aral seas in lat. 45° 50′ N. to the coast of the Arctic Ocean, and across the Kara Strait into Novaia Zemlia, terminating at lat. 76½° N. They divide themselves into three sections: (1) The Northern Urals, from the Arctic Ocean to the source of the Petchora, consisting of wild and rocky mountains, mostly without vegetation, rising at the highest point, Telpös-is, to 5,435 feet. Though only 50 miles in breadth, several parallel chains are formed separated by long valleys crossed transversely by depressions which form easy passes for the transport of the produce of Siberia to Archangel. (2) The Middle Urals, extending S. to the source of the Ufa, a broad table-land rather than a mountain chain, of moderate height, sloping gradually W. and E. The highest points are Nurtchum (5,315 feet), Kirtim (4,265 feet), and Kumba (3,330 feet). The road from Perm to Jekaterinburg is the principal pass. The mineral wealth of the Middle Urals is great and consists of gold, silver, copper, platinum, iron, and coal. This district yields one-third of the whole iron produce of Russia. (3) The Southern Urals extending S. in three divisions, the extreme W. of which stretches along the right bank of the Ural river. Its highest points are Iremel (5,230 feet), Taganai (3,440 feet), and Vurma (3,448 feet).

URALSK, a province of Russia, lying in the main east of the Ural river. It is one of the border provinces between Europe and Asia and has an area of 139,168 square miles. It is largely made up of dry steppes and deserts inclining to the Caspian, with a number of salt lakes and streams, of which only the Ural and the Emba reach the Caspian. The temperature varies greatly, the land is arid, the leading occupations being fishing and cattle raising. The fish products are valuable and those exported exceed in annual value $1,500,000. Pop. about 880,000, two-thirds being Kirghizes. The capital of the province is Uralsk; pop. about 50,000.

URANINITE, or **PITCHBLENDE**, an ore of uranium from which radium is prepared. It is found in small quantities in Cornwall (England), Austria, Colorado, Connecticut, and North Carolina. The name is derived from the German Pechblende, owing to the similarity of the mineral to pitch and zinc-blende. It is black and opaque, with a dull luster, and gives a brownish black streak on paper. It may contain as much as 88 per cent. of uranium oxide, with small percentages of other rare metals, including thorium, cerium, zirconium, lanthanum, yttrium and erbium, the amount of radium amounting to only one part in five million.

URANIUM, a metallic element, symbol U, atomic weight 238.5. Discovered in 1789 by Klaproth, in pitchblende, but first prepared in the pure state by Peligot, in 1840. Its principal ore is pitchblende, but it is also found in clevite, carnitite, samarskite, and fergusonite. It is a white metal, capable of taking a very high polish, with a density of 18.7. It melts at a white heat, and can be distilled in the electric furnace. Chemically it is allied to chromium, molybdenum, and tungsten, and forms two series of salts, uranous and uranyl.

URANUS, in Greek mythology, the most ancient of all the gods. He married Gæa, or Earth, by whom he had, first, the children called the hundred-handed, Briareus, Cottus, and Gyges; secondly, the Cyclopes, Arges, Steropes, and Brontes; thirdly, the Titans, Oceanus, Cœus, Saturnus, etc., and lastly, the Giants. He was dethroned and mutilated by his son Saturnus, and from his blood sprang the Furies, Alecto, Tisiphone, and Megæra.

URUNAS, in astronomy, one of the superior planets between Saturn and Neptune. It was not known to the ancients. When Sir William Herschel, after the construction of his great reflecting telescope, was systematically examining with it all the stars above a certain magnitude, he, on March 13, 1781, found in the constellation Gemini a star which he recognized as having a disk which the others had not. He took it for a comet, and other contemporary astronomers held the same view. Its distance from the sun is about 1,800,000,000 miles, and it travels once around the orbit in about 87 years. It receives only

about one three-thousandth part of the light and heat from the sun which fall on the earth. It is attended by at least four satellites—Ariel, Umbriel, Titania, and Oberon. Their orbits all lie in the same plane, and are at right angles to the path of the planet itself—a circumstance not known in the case of any other planet. Called also Georgium Sidus and Herschel. See SOLAR SYSTEM.

URBAN, the name of eight popes:

URBAN I., succeeded Calixtus I., in 222, and suffered martyrdom in 230.

URBAN II. (Odo of Lagny); born in Châtillon-sur-Marne, France, about 1042, succeeded Victor III. in 1088. He caused Guibert, who had been supported as antipope under the title of Clement III., to be driven out of Rome; preached the first crusade in 1095, and convoked the councils of Bari, Clermont, and Rome. He died in Rome, July 29, 1099.

URBAN III. (Herbert Crivelli), archbishop of Milan, was successor of Lucius III., and was elected to the papal chair in 1185. He endeavored to send assistance to the Christians in the East, who were being sorely pressed by Saladin, but died before he could effect his object. He died in France, Oct. 20, 1187.

URBAN IV., became Pope in succession to Alexander IV. in 1261. He excommunicated Manfred, King of Naples, and offered the crown to Charles, Count of Provençe and Anjou, and brother to



POPE URBAN V.

Louis IX. of France, which led to the subsequent wars of the Anjous for the possession of Sicily and Naples. He died in Orvieto, Italy, Oct. 2, 1265.

URBAN V. succeeded Innocent VI. in 1362. He restored the papal seat from Avignon to Rome, founded many churches, and reformed numerous abuses. He died in Avignon, France, Dec. 16, 1370.

URBAN VI. (Bartholomew Prignano), succeeded Gregory XI. in 1378. The cardinals afterward chose Robert of Geneva, who took the name of Clement VII., and took up his residence in Avignon. Thus was originated the famous "Western Schism," which endured for nearly 50 years. He died in Rome, Oct. 15, 1389.

URBAN VII. succeeded Sixtus V. in 1590, but died in less than a fortnight afterward, Sept. 28, 1590.

URBAN VIII. (Maffeo Barberini); born in 1568, ascended the pontifical throne in 1623. He condemned the Jansenists, revised the hymns of the Roman Catholic Church, and was the author of some Latin and Italian poems. He died in Rome, July 29, 1644.

URBANA, a city of Illinois, and the county-seat of Champaign co., on the Cleveland, Cincinnati, Chicago and St. Louis, the Wabash, and the Illinois Traction railroads. The city is the center of a prosperous farming district, contains extensive railroad repair shops, and manufactories of brick and tile, lawn mowers, etc. Urbana is the seat of the University of Illinois. There are a public library, a county court house, a high school, a post office, a Masonic temple, etc. Pop. (1910) 8,245; (1920) 10,244.

URBANA, a city and county-seat of Champaign co., O.; on the Pittsburgh, Cincinnati, Chicago and St. Louis, the Erie, and the Cleveland, Cincinnati and Chicago railroads; 40 miles W. by N. of Columbus. Here are Urbana University (Swedenborgian), a public library, convent, high school, Children's Home, electric lights, waterworks, National banks, and a number of daily and weekly newspapers. The city has an egg-case factory, broom factories, tannery, woolen mills, railroad car shops, straw-board works, etc. Pop. (1910) 7,739; (1920) 7,621.

URBAN TRANSPORTATION, transportation from one part of a city to another. In the early days such transportation was provided by horse-drawn vehicles, and one of the first innovations was the use of the rail. The introduction of steam and of other methods of transportation without the use of horses went on during the 19th century and now the chief forms of urban transportation are surface roads operated by electricity, cable-operated surface roads, and electrically operated elevated roads and subways. The development in the main has been through the horse-drawn

car, to a car dragged along by a cable, a car driven by electricity derived from an elevated trolley or from underground contact, all of these being supplemented by the motor omnibus. The systems of urban transportation in most American cities were at first established by local capitalists, but later companies usually combined to control the lighting, electric railway and gas facilities, while in other cities the municipal authorities have taken the transportation systems into their hands. The elevated lines in New York were formerly operated with small steam locomotives, but later displaced steam with electricity. In recent years the systems in the larger American cities have become very complicated. According to recent figures, for example, Boston had 231 miles of surface street railway, of which 197 miles had a second track. There were about 14 miles of rapid-transit track, with a second track. In a recent fiscal year the gross earnings amounted to $17,269,000 and the operating expenses amounted to $11,288,000. The number of passengers carried totaled 346,317,000. The miles run were 57,806,000. These results included the traffic on elevated lines and subways.

In New York almost every form of transportation facilities known is in vogue. There are elevated roads, operated by current from a third rail; with electric surface lines below them, operated by underground contact; four track subways lower still; lower still another subway, and still lower, at 42d St., the Queensboro Tube which runs from Manhattan under the East River to Long Island. The tremendous north and south traffic in New York has made it necessary to develop the city transportation to the highest limit, and as a result Manhattan Island is a great object lesson in such transportation. The subway system is the most extensive in the United States, and it has been the model on which the systems of other cities, both in the European countries and the United States, have been constructed. See STREET RAILWAYS.

URBINO, an ancient town of central Italy; in the province of Pesaro and Urbino; between the Foglia and Metauro rivers, remote from the highways of commerce. It is a town of narrow, tortuous streets, with an archbishop's cathedral and other churches; a magnificent ducal palace (1447; restored, and now housing the fine art institution); a free university, dating from 1564, but now attracting less than 100 students, and the house in which Raphael was born, now the town museum. Cheese, silk, pins, and some majolica ware are manufactured, but not the majolica for which the place was famous for a century and a half after 1475. Urbino, anciently the Urbinum Hortense of Umbria, was a municipium under the Romans and was the seat of a line of independent dukes from 1474 to 1626. On the death then of the last duke Urban VIII. took possession of the duchy as a vacant fief; and it belonged to the Papal states till 1860, when it became part of the kingdom of Italy. Pop. about 20,000.

URDÉE, or **URDY**, in heraldry, pointed. A cross-urdée is one in which the extremities are drawn to a sharp point instead of being cut straight.

URE, ANDREW, a Scottish chemist; born in Glasgow, Scotland, May 17, 1778. After lecturing with some success on chemistry, natural philosophy, and materia medica, at Glasgow, he was nominated to the post of astronomer, on an observatory being established in that city. In 1821 he produced a valuable work, entitled a "Dictionary of Chemistry." He took up his residence in the metropolis in 1830, and was four years afterward appointed chemist to the Board of Customs. In 1837 he produced his "Dictionary of Arts, Manufactures, and Mines," a work of immense labor and research, which has gone through many editions, and also has been translated into the leading continental languages. He died in London, Jan. 2, 1857.

UREA, one of the few organic bases of animal origin. It forms an essential constituent of the urine of all animals, and is most abundant in that of the mammalia, particularly so in the case of the carnivora. It is the principal outlet of nitrogen from the system, after the materials which compose the animal tissues have experienced oxidation under the influence of inspired air. A person in good health secretes about an ounce of urea daily. Dumas made several fruitless attempts to form urea from the azotized constituents of the body, but Bechamp has recently succeeded in doing so, by subjecting albumen to the oxidizing action of permanganate of potash. Urea does not appear to be formed in the kidneys, these organs appearing to act more as filters in separating it from the mass of blood in which it is formed before it reaches them; perhaps it is produced in the liver. Urea may be formed artificially in several ways, and was one of the first organic products made from inorganic materials. The easiest method of procuring it is by heating together 56 parts of ferrocyanide of potassium with 28

of black oxide of manganese, and washing the residue obtained. The cyanate of potash thus formed is transformed into the ammonia salt by dissolving it in 41 parts of sulphate of ammonia. The cyanate of ammonia may be dissolved out by alcohol, and slow evaporation converts it into urea. It crystallizes in white, slender, straited prisms, which are slightly deliquescent. Its solution has a cool, bitterish taste, and is neutral to test paper. It is very soluble in water and hot alcohol, but sparingly so in ether. It does not appear to form a definite hydrate. It melts at about 270° F., and at a temperature a little above this it is decomposed into ammonia, carbonate of ammonia, and metameric acid. A solution of urea, heated in a sealed tube, takes up four equivalents of water, and is converted into carbonate of ammonia. The same change takes place in stale urine; hence its ammoniacal odor after keeping it a few days. Though forming salts with certain of the acids, urea does not possess well-marked basic properties. With nitric and oxalic acids it forms crystallizable salts. With certain metallic oxides and salts, such as the oxides and nitrates of silver and mercury, it forms definite crystalline compounds. Urea constitutes about one and a half per cent. of the urine of a healthy person, or about one-third of its solid constituents. The hydrogen in urea may be replaced by compound radicles, such as ethyl, phenyl, etc., giving rise to numerous compounds, known as the compound urea. It also combines with other radicles, forming ureides.

URENA, in botany, the typical genus of *Ureneæ*. Involucre and calyx five-cleft; style divided above into 10 portions; carpels, five, prickly at the top. *U. lobata*, a shrub commonly occurring with the mango and bamboo in Bengal and throughout India, and *U. sinuata*, a small Indian shrub, have strong fibers, probably well adapted for the manufacture of sacking and twine. In Brazil a decoction of the root and stem of *U. lobata* is employed as a remedy in windy colic, and the flowers are given as an expectorant in dry and inveterate cough.

URETHRA, in anatomy, a membranous tube running from the bladder first directly downward and then forward beneath the arch of the pubes. It is the excretory passage for the urine, serving also in the male for the ejaculation of the semen.

URFÉ, HONORÉ D', a French romance-writer; born in Marseilles, France, Feb. 11, 1568. He is celebrated for his immensely popular bucolic and allegorical romance "Astrée" (1st part, 1610). It introduces us to a sort of ideal world, in which elegant ladies and gentlemen appear clad as shepherds and shepherdesses, and make pretty observations on topics of the period. He left it unfinished, and the conclusion was supplied by his secretary. He died in Villefranche, France, June 1, 1625.

URGA, a town of Mongolia; on the Tola river; in a valley in the great Asiatic plateau; 180 miles S. E. of Kiachta, on the trade route to Peking. It is the religious center for northern Mongolia, has considerable trade, and a population (partly living in tents outside the city proper) of about 30,000, mostly Chinese. In and about the town, which is the seat of the Bogdan or chief Lama of the Mongols, there are about 14,000 Mongolian Lamas.

URI, one of the "Forest Cantons" of Switzerland; forms part of the hill country which surrounds the Lake of Lucerne; area, 415 square miles; pop. about 25,000. It consists of one valley, that of the Reuss, through which runs the great road, and also the railway, into Italy by the St. Gothard Pass. Uri is almost entirely pastoral; and the constitution is a pure democracy.

URIC ACID, a very important excrementitious product, which occurs in small quantities in human urine, to the extent of rather less than 1 per cent. of the solid matter contained in it. It is met with in much greater abundance in the excrement of birds and reptiles, that of the boa consisting almost entirely of urate of ammonia. Guano also contains large quantities of it, and has been most extensively employed as its source in the now almost extinct manufacture of murexide dyes. When excess of uric acid is secreted in the system, it deposits hard crystallizing grains in the bladder, which, if retained, gradually form concretionary calculi, and grow into the disease known as gravel or stones. In gouty patients, uric acid accumulates around the joints, forming white friable concretions, known improperly as chalkstones. Uric acid is generally prepared by dissolving the dried excrement of the boa in water, and converting the urate of ammonia into nitrate of potash by adding excess of potash, and boiling till the whole of the ammonia has been set free. Hydrochloric acid is then added, and the acid separates in minute crystals, which are thoroughly washed and dried. Pure uric acid is a white crystalline powder, requiring 10,000 parts of water

for solution, to which it imparts a very feeble acid reaction. It is insoluble in alcohol and ether, but dissolves in concentrated sulphuric acid, which deposits it in a hydrated condition or dilution. The urates of the alkalies are much more soluble than the acid itself. Uric acid is dibasic, giving rise to acid and neutral salts. By being submitted to heat, uric acid breaks up into a number of compounds, but the remarkable number of definite and crystallizable substances which it gives rise to, when treated with various oxidizing agents, present the highest physiological interest, inasmuch as the great changes which occur in the animal economy under the influence of vitality are always accompanied by oxidation.

URINE, the secretion of the kidneys, the chief fluid excretion of man and of the higher animals. Healthy human urine is a transparent light amber-colored liquid, having a saline taste, a peculiar aromatic odor, an acid reaction, and a density varying from 1.010 to 1.025. Its chief constituents are urea, uric, lactic, and hippuric acids, and creatine, together with calcium and magnesium sulphates, chlorides and phosphates, alkaline salts, certain imperfectly known principles, and a coloring substance. The urine contains the liquid portion of useless and noxious residuum left after the assimilation of whatever is useful to the structure.

Morbid states of the urine occur—the aqueous, the subaqueous, the lithic, the phosphatic, the purpuric, the albuminous, and the saccharine. Aqueous urine, with a diminution in its solid contents, is passed in large quantity by nervous and hysteric persons, especially when they approach old age. Subaqueous urine, in some respects the opposite of the first, carries off an unduly large proportion of solid matters, and exists chiefly in decline of the bodily powers, which it tends to accelerate. Lithic urine deposits a pink or purple sand or "gravel," consisting of lithia; its ultimate tendency is to produce lithic calculi. Phosphatic urine contains an excess of phosphatic salts, and deposits a white earthy or chalky powder. Purpuric urine deposits a lateritious sediment. Albuminous urine deposits albumen; sometimes it is an unimportant, but at other a very formidable disease. Saccharine urine is an attendant on diabetes. The mechanism by which the urine is secreted is apparently of a double kind: (1) uriniferous tubules, which seem to be actively secreting structures, and (2) the Melpighian capsules, which appear to act rather as a filtering apparatus.

URQUHART, DAVID, a Scotch economist; born in Braelangwell, Scotland, in 1805; was educated at Oxford University after which he entered the diplomatic service; was secretary of the British embassy at Constantinople in 1835-1836. He was a representative for Stafford in Parliament in 1847-1852. During most of his public career he antagonized the Eastern policy of Lord Palmerston, which he held was subservient to the ambitious wishes of Russia. His publications include "England, France, Russia, and Turkey" (1835); "The Spirit of the East, a Journal of Travels Through Roumeli" (2 vols. 1838); "The Progress of Russia in the West, North, and South" (1853); "Letters and Essays on Russian Aggressions" (1853); etc. He died in Naples, May 16, 1877.

URSA MAJOR, in astronomy, the Great Bear, the most conspicuous of the 20 ancient northern constellations, its seven leading stars attracting notice all the more conspicuously that there is a certain absence of visible heavenly bodies in the adjacent parts of the sky. The Semitic conception of the constellation was that it resembled a bier with mourners walking behind, and it has sometimes been called specifically Lazarus' bier, the four stars constituting a four-sided figure being the bier and the other three, Mary, Martha and Mary Magdalene, the mourners. It is much like a plow, and is often called the Plow, the rectangle constituting its body, and the three projecting stars its handle. To other minds it suggests a vehicle, whence it has been called the Car of David, and sometimes Charles' Wain or Wagon. The four stars standing together are the wheels, and the three behind are the shaft. Another name is the Dipper. But astronomers cling to the old classical conception of a bear, of which the four stars, Alpha, Beta, Gamma, Delta, Ursæ Majoris, are the hind quarter, and the three the tail. The remaining portions of the animal are marked out by sundry small stars of the third and fourth magnitude. The Bear was supposed to require a ward or keeper. The Arabs gave the seven conspicuous stars names, some of which are still in use. They are called Alpha, Ursæ Majoris or Dubhe; Beta, Merak; Gamma, Phecda; Delta, Megrez; Epsilon, Alioth; Zeta, Mizar; and Eta, Alcaid, or Benetnasch. The first two are called pointers, because a line drawn from Beta through Alpha and continued for about five times as far as the distance between them will reach the pole star. Ursa Major is bounded on the N. by Draco and Camelopardalis, on the S. by Leo Minor, on the

E. by Canes Venatici, and on the W. by Lynx and Camelopardalis. Of the seven stars six are of the second magnitude, the remaining one (Delta) being at present between the third or fourth magnitude. Mizar (Zeta) is a double star. Powerful telescopes show that the Great Bear is made up of many thousand other stars.

URSA MINOR, in astronomy, the Little Bear; one of the 20 ancient northern constellations, bounded by Draco, Camelopardalis, Cassiopeia and Perseus. Its contour is marked out by seven stars. The curvature of the tail is in the contrary direction to that of the Great Bear; and at its tip is a star of the second magnitude, Alpha Ursæ Minoris, called Polaris, or the Pole Star, midway between Cassiopeia and the Great Bear. Next in brightness are Beta Ursæ Minoris, called by the Arabs Kobab, and Gamma Ursæ Minoris. The two are sometimes designated the Guards of the Pole, or simply the Guards. Kobab is of the second, and the other of the third. The remaining stars are smaller.

URSIDÆ, bears; a family of the Carnivora, group arctoidea, or, in older classifications, plantigrada. Claws, five on each foot, large, strong and curved, nonretractile; tongue smooth; ears small, erect, and rounded; tail short; nose forming a movable truncated snout; cæcum absent. Though ranged with the Carnivora, many of the ursidæ live entirely or partially on vegetable diet, and their teeth are modified accordingly. They are widely distributed, but are entirely absent from the Australian and Ethiopian regions, and only one species, *U.* (or *Tremarctos*) *ornatus*, from the Andes of Peru and Chile. Wallace reckons 15 species, which have been grouped into as many as five genera (*Ursus Thalassarctos, Helarctos, Melursus* or *Prochilus*, and *Tremarctos*); Mivart makes two genera (*Ursus* and *Melursus*); and Professor Flower includes *Ailuropus*, an annectant form connecting *Ursus* with *Ailurus*. The family appears first in the Miocene.

URSINUS COLLEGE, a coeducational institution in Collegeville, Pa.; founded in 1869 under the auspices of the German Reformed Church; reported at the close of 1919: Professors and instructors 17, students, 224, number of graduates, 750; president, G. L. Omwake, Ph. D.

URSULA, ST., the heroine of a very curious legend of the Middle Ages, whose origin may be ascribed to the 12th century, and which runs as follows: Deonatus, King of Britain, had a very beautiful and pious daughter named Ursula. She was sought in marriage by the heathen prince Holofernes. His suit was granted, but under the following conditions—the prince must become Christian, and wait for three years while the bride-elect went with her companions on a pilgrimage to Rome. The suitor was immediately baptized under the name of Ætherius, and Ursula set out with 11 vessels, in each of which there were 1,000 companion virgins. The company crossed the sea and sailed up the Rhine as far as Basel, from thence they proceeded overland to Rome, where they were honorably received by Pope Cyriakus. The pious and gallant pontiff, along with a multitude of dignified ecclesiastics, accompanied his fair guests a great part of the return journey, and according to some accounts even shared in the final destruction that suddenly overtook the band; for as they were about to land at Köln they were set on by a horde of heathen Huns, by whom they were all slaughtered. Ursula was at first reserved as a bride for Etzel, the Hun king, and on her steadfast refusal of the offer she was transfixed by an arrow, and thus she is represented in mediæval art. But the bloody deed was no sooner accomplished than 11,000 celestial warriors appeared, who completely routed the Huns and freed Köln. The citizens buried the unhappy maidens with pious care by the Rhine, held afterward sacred, and there too Clematius, a Greek pilgrim, built a church in their honor.

The story excited suspicion even in a credulous age. But confirmations were not wanting. St. Elizabeth, abbess of the cloister Schönau, by Oberwesel, held spiritual communication with St. Verena, one of the murdered virgins, and saw the whole tragedy enacted as in a vision. Moreover, Egbert, brother of the abbess, and inspired by her, wrote down an explanation and defense of the story. In this several awkward inconsistencies were smoothed away. Thus there was no mention by Roman chroniclers of a Pope Cyriakus; but this (explained the narrator) was because the cardinals were angry at his leaving the city, and blotted out all mention of him from the records of the Church. If it was asked how the virgins made such excellent sailors, it was replied that King Deonatus had with prudent foresight concealed a number of mariners in the hold of each vessel, and so on. Later critics have striven to explain the vastness of the number. It has been ingeniously conjectured that the number, at first 11, became 11,000 by reading the letter M. (meaning martyred) as the Roman

numeral 1,000. However this may be, it seems probable that some Christian maidens were really murdered by heathen invaders near Köln, and that the story has thus some basis of fact.

URSULINES, members of one of those religious orders which resulted from the rise of the Roman Church of the evangelical zeal which was so remarkable a reflex effect of the Reformation. Angela or Angelica Merici (1470-1540), a poor maiden of Desenzano, was their founder. She began in that town, and continued afterward in Brescia, the education of poor children. At the grave of Varallo at Milan, a favorite resort of pilgrims, she was inspired with the determination to found a new religious order, and at the celebration of the mass in St. Afra Church at Brescia, on Nov. 25, 1535, the order, as a free union without binding vows, was solemnly inaugurated, and named in honor of St. Ursula. Its object was the performance of certain church and household devotions, the instruction of young females, and the bodily and spiritual care of the poor and sick. The order was to be immediately under the supervision of a priest and matron, and Angelica was herself chosen as first matron on March 18, 1537, by the 76 members of the society, and as such she watched over the affairs of the order till her death, three years later, when she was succeeded by the Countess Lucrezia of Ladrone. On June 9, 1544, the order received papal sanction from Paul III., and in 1584 it had increased to 600 nuns in 18 establishments. It quickly spread itself from Italy into other lands, and at the beginning of the 18th century had 20 congregations, 350 convents, and from 15,000 to 20,000 nuns. It was not quite the same in all countries, and was never bound together so strictly as other religious orders were. No general assembly or provincial chapters were held, so that each settlement of the Ursulines stood under the power of the bishop of the diocese. One of its latest developments was the congregation of Chavagnes, in La Vendée, founded by Demoiselle Bréchard in 1805, and containing, in 1862, 300 to 400 sisters in about 30 houses.

URTICACEÆ, in botany, nettleworts; an order of declinous exogens, typical of the alliance Urticales. Tree, shrubs, or herbs, never milky. Leaves alternate, usually covered with asperities or stinging hairs; stipules membranous, often deciduous; flowers small, green, unisexual, scattered, clustered, in catkins or in close heads; calyx membranous, persistent—in the males it is four or five-parted, with four or five stamens inserted into its base opposite to its lobes; females with a tubular, four to five-cleft calyx, three to five staminodes, the style simple or wanting, the stigma simple, fringed, the ovary superior, sessile, one-celled, with a single erect ovule; the fruit a simple inhediscent nut surounded by the calyx.

URUGUAY, a republic of South America; bounded on the N. and N. E. by Brazil, E. and S. E. by the Atlantic Ocean, S. by the Rio de la Plata, and W. by the Uruguay, which last-named rivers separate the state from the Argentine Confederation. Uruguay has an extreme length of 350 miles by a breadth of 320; area, 72,153 square miles; pop. about 1,500,000. Uruguay is divided into 19 provinces, and the chief towns are Montevideo (the capital), Maldonado, Salto, Paysandu, Mercedes, Colonia, and San José.

Physical Features.—The coast to the N. of Cape Santa Maria is low and sandy, but S. and W. of it, and on the estuary of the Plata, it is more bold and indented, presenting some fine bays and harbors. The most important rivers in the interior are the Rio Negro, with its numerous affluents, and the Arapey, Daiman, Yaguaron, and Sebollati. The greater portion of the surface consists of an elevated plateau, penetrated by many fertile valleys along the S. coast line. The surface of this tableland presents a series of extensive plains, traversed by occasional ranges of hills of no great elevation, the whole being almost destitute of trees. The climate is remarkably mild and salubrious. The minerals are copper, potter's earth, umber. The soil is generally rich and fertile. Wheat, maize, barley, oats, rice, pulse, flax, hemp, cotton, tobacco and sugar are the products. Fruits and wine are produced in abundance.

Zoölogy.—Among the wild animals are the tapir, deer, ounce, monkey, paca, rabbit, and fox; and large packs of wild dogs roam over the plains. There are also many varieties of birds and water fowl. Vast droves of horses and horned cattle run wild on the pampas, the latter furnishing the jerked and salted beef, tallow, hides, horns, and hair, which constitute the great bulk of the exports of the country.

Products and Commerce.—The imports of the republic are principally from the United States, Great Britain, Argentina, and Brazil. In 1919 the imports amounted to about $42,000,000; exports to about $137,000,000. In 1916 there were 1,654 miles of railroads, and 4,808 miles of telegraph in operation. For the year 1918-1919 the revenue was

estimated at about $37,000,000; and the expenditure at about $34,000,000. The national debt was $173,703,000.

Government.—The constitution of Uruguay is liberal and representative.

Religion.—The established religion is Roman Catholic; other forms of worship are, however, tolerated. The inhabitants are chiefly Creoles of Spanish descent, the Indians and negroes being a comparatively small number.

History.—The territory forming the present republic of Uruguay was originally settled by a party of Spanish colonists from Buenos Aires, and its possession caused a subsequent war between Spain and Portugal, during which it was several times occupied by both. Eventually, however, the country remained in the hands of Spain, who annexed it to the viceroyalty of Buenos Ayres, under the name of Banda Oriental. On the outbreak of the war of independence, the state espoused the side of Buenos Aires against the mother country, but soon separated from that republic. Annexed by Brazil in 1821, a war ensued, 1826-1828, which was terminated by a treaty of peace, effected through the agency of Great Britain in the latter year, by which the N. part of the territory known as the Seven Missions, was ceded to Brazil, and the S. portion declared an independent state under the style and title of Republica del Uruguay Oriental. Intestine commotions resulted, followed by a war between Uruguay and Buenos Aires. England and France being called on to interfere, an allied fleet blockaded Montevideo, 1848-1849, and peace was restored in 1851. In 1860 a revolution took place under Flores, who was defeated in 1863, but reinstated by Brazil in 1865, and assassinated in 1868.

From 1868 on, political conditions improved considerably. Although there were, from time to time, minor disturbances in connection with the presidential elections, the latter were in the main held in accordance with the constitutional provisions, and as a rule, the candidates elected were permitted to assume their office. The resources of the country were developed more fully and many liberal and progressive laws were passed. As a result of the World War, the country during 1914-1915, passed through a severe financial crisis, which was partially relieved by foreign loans. In 1917 a constitutional convention adopted a new constitution, which went into effect March 1, 1919. As a result of the sinking by German forces of a Uruguayan ship, the Chamber of Deputies finally, on Oct. 7, 1917, voted to break off diplomatic relations with Germany. Eight German steamships, interned in the harbor of Montevideo, with a total tonnage of 42,000, were seized. Dr. Baltasar Brum was inaugurated as president on Sept. 19, 1919. Congress approved the Versailles Treaty of Peace with Germany, and on Nov. 24, 1919, it declared in favor of a League of Nations.

URUGUAY, a river of South America, which rises in Brazil, in the province of Santa Catharina, flows first W., then gradually turns S., and finally enters the estuary of La Plata opposite Buenos Aires; length, about 800 miles.

URUMIAH, OROOMIAH, or **URMIAH**, a city of Persia, in Azerbaijan; 64 miles S. W. of Tabriz. It is supposed to be the birthplace of Zoroaster. It is a fortified town and has a population of about 25,000.

URUMIAH, a salt lake in Azerbaijan, 3,900 feet above sea-level; with a length of 90 miles, a breadth of 30 miles, and a circumference of not less than 250 miles. It contains 6 large and about 50 smaller islands, and receives 14 streams, of which the largest are the Jagatu, Tatau, Sefichai, and Ajichai. It has no apparent outlet. The depth for 2 miles does not exceed 3 feet, the average depth is under 12 feet, the greatest depth ascertained 45 feet. The water is so largely impregnated with salt that no fish can live in it, and the banks are covered with a thick saline incrustation, from which a salt of beautiful transparency is obtained for commerce.

USEDOM, a Prussian island in the Baltic; on the coast of Pomerania; area, 150 square miles. The inhabitants are employed in agriculture and fishing; chief towns, Swinemünde and Usedom. Pop. about 35,000.

USENER, HERMANN KARL, a German classical philologist; born in Weilburg on the Lahn, Oct. 13, 1834; became professor in the University of Bonn. Among his works are: "Philology and the Science of History" (1882); "Ancient Greek Versification" (1887); "Researches in the History of Religion" (1889); "Names of Gods: An Attempt to Account for Religious Concepts" (1895); etc. He died Oct. 21, 1905.

USHANT, an island off the W. coast of France; included in the department of Finisterre; area 20 square miles. Pop. about 2,500. The coasts are escarped and difficult of access; the soil is fertile. The island has two lighthouses and a telegraph station. Off Ushant two celebrated sea fights took place between the English and the French in 1778, and

in 1794. The first was indecisive; in the second Lord Howe gained a great victory.

USHER, NATHANIEL REILLY, an American naval officer, born in Vincennes, Ind., in 1855. He was graduated from the United States Naval Academy in 1875, was promoted ensign in 1876 and gradually rose to the rank of rear admiral in 1911. During the Spanish-American War he commanded the "Ericsson." His other assignments included service with General Board, Navy Department (1903-1904); Bureau of Navigation (1904-1906); "St. Louis" (1906-1908); Bureau of Navigation (1908-1909); "Michigan" (1910-1911); president of the Naval Examining and Retiring Board (1911-1912); command of the 4th Division Atlantic Fleet (1912); 2d Division (1912-1913); 3d Division (1913); Norfolk Navy Yard (1913-1914); and New York Navy Yard (1914-1918). He was retired on account of age in April, 1919.

USHER, ROLAND GREEN, an American educator and historian, born at Lynn, Mass., in 1880. He was educated at Harvard, Oxford, Paris, and Cambridge Universities. His entire career as a teacher of history was spent at Washington University, St. Louis, Mo., where he was successively instructor of history (1907-1910); assistant professor (1910-1912); associate professor (1912-1914); and full professor since 1914. He was a member of various historical and educational societies and wrote: "Presbyterian Movement in the Reign of Queen Elizabeth" (1905); "The Reconstruction of the English Church" (1910); "Pan-Germanism" (1913); "The Rise and Fall of the High Commission" (1913); "The Rise of the American People" (1914); "Pan-Americanism" (1915); "The Challenge of the Future" (1916); "A Critical Study of the Historical Method of Samuel Rawson Gardiner" (1916); "The Winning of the War" (1918); "The Pilgrims and Their History" (1918); "The Story of the Great War" (1919).

USK, a river of Wales and England which enters the estuary of the Severn 3½ miles S. of Newport, and 18 miles N. W. of Bristol; length, 60 miles.

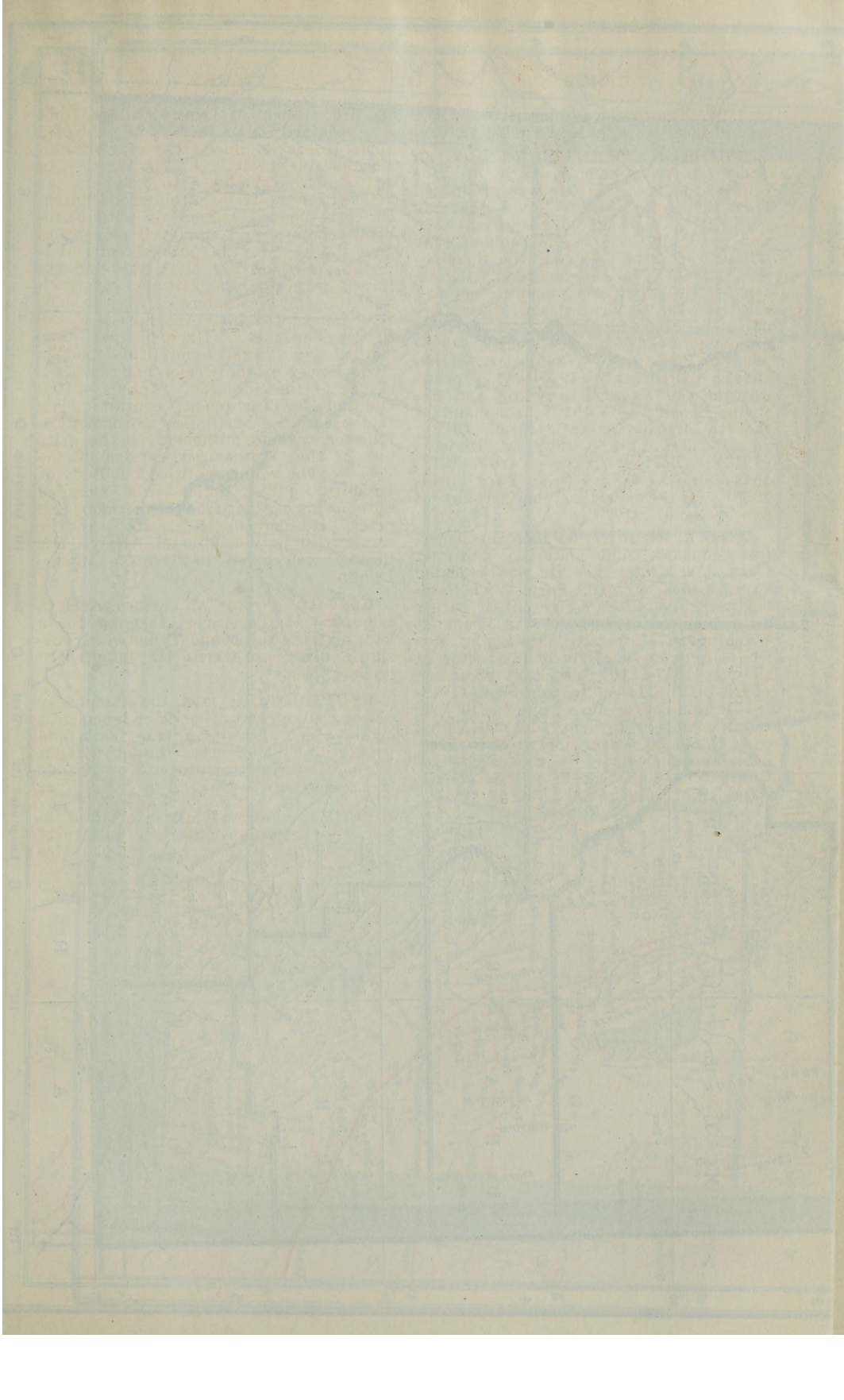
USKUP, or **SKOPLJE**, Jugoslavia, in the department of the same name; on the Vardar river, and on the Salonika-Mitrovitza railway, 110 miles N. N. W. of Salonika. It is the seat of an archbishop, and has manufactures of leather, and a pop. of about 50,000.

USSHER, JAMES, an Irish clergyman, archbishop of Armagh; born in Dublin, Ireland, Jan. 4, 1581. He was the first student of Trinity College, Dublin; ordained 1601. In 1612 he published "The Unbroken Succession of Christian Churches, Especially in the West." In 1615 he was employed to draw up the articles for the Irish Established Church. He corresponded extensively with European scholars, and employed persons to visit the East for the purchase of manuscripts; two of the most valuable obtained were the Samaritan Pentateuch and the Old Testament in Syriac. In 1639 he printed his "Antiquities of the British Churches." His principal other works are: "Tracts on Episcopacy"; "The Power of the Prince and the Obedience of the Subject"; "Annals of the Old and New Testament," containing his famous scheme of Biblical chronology—followed without authority, by the printers of the "Authorized Version of the Bible." The volume entitled, "A Body of Divinity" (1854, folio) was compiled without his consent from his sermons and notes. He died March 21, 1656; and he was buried in Westminster Abbey. His library was given to Trinity College, Dublin.

USSURI, a river of eastern Asia, a tributary of the Amur; forming for a long distance the boundary between Russian and Chinese territories; length, 450 miles.

USUFRUCT, in law, the temporary use and enjoyment of lands or tenements, or the right of receiving the fruits and profits of land, or other things, without having the right to alienate or change the property.

USURY, an excessive or exorbitant interest or premium paid, or stipulated to be paid, for the loan of money. Also the practice of lending money at interest; the practice of taking interest for money lent; specifically, the practice of taking exorbitant or excessive interest for the loan of money; the practice of exacting interest in an exorbitant way from needy or extravagant borrowers. In the ancient world, interest was always usurious as it is in the East at the present day. The Mosaic Law prohibited taking interest from Hebrews (Exod. xxii: 25; Levit. xxv: 35-37; Deut. xxiii: 20); and Christ's words, "Give to him that asketh thee" (Matt. v: 42), seem to be of still wider application. The Fathers regarded interest as usury, and therefore as a species of robbery; and this opinion prevailed in the Church till the 16th century, and numbered Luther and Melanchthon among its defenders. Calvin appears to have been the first theologian who propounded the modern distinction between interest and usury.




UTAH
SCALE OF STATUTE MILES
0 5 10 20 30 40 50 60 70
SCALE OF KILOMETERS
0 10 20 30 40 50 60 70 80 90 100
County Towns ◎
Railroads
Longitude 112° West from Greenwich
Copyright, J. J. Foster Eng. Co., 1913

UTAH, a State in the Western Division of the North American Union; bounded by Wyoming, Colorado, Arizona, Nevada, and Idaho; admitted to the Union, Jan. 4, 1896; number of counties, 27; capital, Salt Lake City; area 84,990 square miles; pop. (1890) 210,779; (1900) 276,749; (1910) 373,351; (1920) 449,396.

Topography.—The surface of Utah is similar to a basin surrounded by high mountains. The interior has an elevation of 4,000 feet above sea-level, and is crossed in a N. E. and S. W. direction by the Wasatch Mountains with an altitude of 12,000 feet. E. of the Wasatch Mountains are the Uintah, near the Wyoming boundary, and W. are numerous detached hills, ridges, and isolated mountains. Lofty plateaus occupy the S. E. The principal rivers are the Green and Grand, uniting in the S. E. to form the Colorado. Nearly all the others empty into the Great Salt Lake, or similar salt lakes with no outlets, which occur throughout the W. of the State. The Great Salt Lake is about 80 miles in length and has an average width of 40 miles; its waters are salty, and it has no communication with the ocean. It is connected with Utah Lake by the Jordan river. Sevier Lake, another large body, has no outlet, but receives the North Sevier river. Utah contains part of the great cañon of the Colorado, and the Great American Desert, an extensive sandy and waterless plain W. of the Great Salt Lake.

Geology and Mineralogy.—The rocks are mostly primitive, of Archæan origin, and showing everywhere evidences of volcanic action. Limestone of carboniferous deposit is found in many ridges. Granite, gneiss, jasper, syenite, porphyry, quartz, serpentine, gypsum, marble, calcareous spar, and sandstones occur in large quantities throughout the State. Iron ores, coal, gold, and silver, copper, zinc, salt, asphaltum, and borax form the principal mineral resources.

The production of gold in 1920 was 100,446 fine ounces, valued at $2,076,400. The silver production was 11,564,155 fine ounces, valued at $11,739,121. The production of copper in 1919 was 146,178,008 pounds, compared with a production in 1918 of 230,964,908. Utah ranked fourth among the States in 1919 in the production of copper. The coal production in 1919 was 4,570,000 tons, a decrease of 567,000 tons over the production of the year previous. Other important mineral products are manganese ores, gypsum, petroleum, sulphur, and zinc. Salt, obtained from the Great Salt Lake, is also an important mineral product.

Agriculture.—The soil is as a rule arid and sandy, and in many places so impregnated with salt as to be entirely useless. Much, however, has been reclaimed by irrigation and rendered profitably productive. In the highland portion of the State rainfall is sufficient for cultivation and the mountains and high valleys produce an abundance of fine grass, in consequence of which stock raising and dairy farming have been greatly developed. The acreage, value and production of the principal crops, in 1919, were as follows: corn, 24,000 acres, production 432,000 bushels, value $648,000; oats, 72,000 acres, production 2,448,000 bushels, value $2,390,000; barley, 20,000 acres, production 600,000 bushels, value $846,000; wheat, 304,000 acres, production 3,682,000 bushels, value $7,732,000; hay, 453,000 acres, production 938,000 tons, value $20,542,000; potatoes, 17,000 acres, production 2,397,000 bushels, value $3,284,000.

Manufactures.—There were, in 1914, 1,109 manufacturing establishments in the State, employing 13,894 wage earners. The capital invested was $71,843,000; the wages paid amounted to $10,852,000; the value of the materials used was $62,233,000; and the value of the finished product was $87,112,000. The principal manufactures were beet sugar, railroad cars, flour and grist, packed meat, printing and publishing, woolen goods, bread and other bakery products, foundry and machine shop products, preserved and canned fruits, malt liquors and leather goods. Salt Lake City is the principal manufacturing center.

Banking.—On Oct. 31, 1919, there were reported 26 National banks in operation, having $3,455,000 in capital, $3,363,000 in outstanding circulation, and $15,109,000 in United States bonds. There were also 99 State and stock savings banks with $7,240,000 in capital, and $2,862,000 in surplus. The exchanges at the United States clearing house at Salt Lake City during the year ending Sept. 30, 1919, amounted to $778,679,000, an increase over those of the preceding year of $68,314,000.

Education.—The percentage of illiteracy in the State is extremely low. There were enrolled in the public schools, in 1918, 110,193 pupils. The entire school population was 134,887, and there were in the elementary high schools 289 male and 2,115 female teachers. In the junior high schools there were 75 male and 164 female teachers, and in the high schools, 211 male and 215 female teachers. The disbursements for educational purposes during the year amounted to

$5,549,398. There are a State Normal School and a Church Teachers' Summer School, maintained by the Mormons. The institutions for higher education include the University of Utah, State School of Mines, State Agricultural College, Brigham Young University, Brigham Young College, and the Latter Day Saints University.

Churches.—The strongest denominations in the State are the Church of Jesus Christ of Latter-Day Saints; Roman Catholic; Methodist Episcopal; Protestant Episcopal; Presbyterian, North; and Congregational.

Railways.—The railway mileage in the State in 1919 was approximately 2,447 miles. The roads having the longest mileage are the Denver and Rio Grande, and the San Pedro, Los Angeles and Salt Lake railroads.

Finances.—The receipts for the fiscal year 1917-1918 were $8,838,332, and the disbursements $8,556,750. There was a balance on Dec. 1, 1918, of $1,505,512. The assessed valuation in 1919 was about $675,000,000. The bonded debt of the State amounts to about $3,500,000.

Charities and Corrections.—The institutions under State control include a prison in Salt Lake City, Industrial School at Ogden, School for Deaf and Blind at Ogden, and the Mental Hospital at Provo.

State Government.—The governor is elected for a term of four years. Legislative sessions are held biennially and are limited in length to 60 days each. The Legislature has 18 members in the Senate, and 46 in the House. There are two Representatives in Congress.

History.—The region embracing Utah was acquired from Mexico in 1848, and the Territory was organized in 1850, comprising Utah, Colorado, Wyoming, and Nevada. The Mormons led by Brigham Young settled in Salt Lake City valley in 1847, and rapidly occupied the fertile valleys of the Territory, few Gentiles settling there till the extension of railroads made it more easily accessible. At a later period the Gentile population rapidly increased, and vigorously opposed the supremacy of the Mormons, who controlled all government positions. A bill passed by Congress in 1882 disfranchised all polygamists and annulled the act of the Territorial Legislature extending the franchise to women. In 1887 a bill was passed, which confiscated the property of the Mormon Church and the perpetual Emigration Fund, with the exception of the church buildings and parsonages, and devoted it to the support of public schools in the Territory. The Mormons renounced polygamy in 1890. For a considerable time previously efforts had been made to have Utah admitted into the Union; but this was not acceptable to Congress till after the abolition of polygamy. A bill was passed in December, 1893, making Utah a State. It was not finally consummated, however, till Jan. 4, 1896, when it entered into Statehood as the 45th State of the Union.

UTAH, UNIVERSITY OF, a coeducational, non-sectarian institution in Salt Lake City, Utah; founded in 1850; reported at the close of 1919: Professors and instructors, 156; students, 1,250; president, John A. Widtsoe, LL. D.

UTAHS, or **UTES,** a tribe of American Indians of the Shoshone family, living on reservations in Utah and California, having sold most of their lands to the United States Government. They number about 12,000.

UTERUS, in comparative anatomy, a dilation in the walls of the oviduct for the preservation or development of the ova. In birds, although the ova are developed externally, the term uterus is often applied to that cavity where the eggs receive the shell. In most of the viviparous fishes, and in the viviparous lacertilia and ophidia the ova develop within the uterine cavity without any assistance or nourishment from the mother. In the Prototheria (=*Ornithodelphia*=*Monotremata*) the oviducts according to some authorities, have no distinct uterine or Fallopian portion, but open directly into a cloacal chamber. Gegenbaur, however, calls the lower end of each oviduct a uterus. In the Metatheria (=*Didelphia*=*Marsupialia*) each of the oviducts is differentiated into uterine and Fallopian tracts, opening into a long and distinct vagina. In the Eutheria (=*Monodelphia*, including all other mammals) the uterus is variously modified. In the Primates it is normally single, though instances of a double uterus occasionally occur; it is two-horned in the Ruminantia, Pachydermata, Equidæ, and Cetacea, and is said to be divided when it has only a very short body, which speedily divides externally and internally, and is continuous with the oviducts (as in most of the Carnivora and Edentata, and some of the Rodentia); it is actually double in some of the Edentata and in most of the Rodentia, including the mouse and the hare, each oviduct passing into an intestiniform uterus, which has two completely distinct openings lying near to each other within the vagina.

In human anatomy, a hollow, muscular organ, with very thick walls, situated in the pelvic cavity, between the rectum and

the bladder. The virgin uterus is about three inches long, two broad, and one inch thick at its upper extremity. The middle part is called the body, the upper the fundus, and the lower, opening into the vagina, the neck. Its chief function is to receive the ovum from the Fallopian tubes, and to retain and support it during the development of the fœtus, which it expels by muscular contraction at parturition. During uterogestation the uterus becomes greatly enlarged and undergoes important structural changes; the uterus is liable to many affections and diseases, as tumors, ulceration, catarrh, tenesmus, hemorrhage, etc.

UTICA, a city of New York, the county-seat of Oneida co. It is on the Mohawk river, the State Barge canal, and on the New York Central, the New York, Ontario and Western, the Delaware, Lackawanna and Western, the Adirondack and St. Lawrence, and the West Shore railroads. The city is attractively situated at an elevation of about 430 feet. The streets are well laid out and maintained. The city has an area of 1,055 square miles. The notable buildings include a city hall, United States Government building, State armory, Munson Williams Memorial, Y. M. C. A. building, Y. W. C. A. building, Utica Free Academy, and the State Masonic Home. There is a national public library with nearly 100,000 volumes. There are also several other libraries in the city. Utica has an unusual number of charitable institutions. These include the Home for Aged Men and Couples, Utica Orphan Asylum, St. Vincent's Industrial School, St. John's Orphan Asylum, House of the Good Shepherd, and four hospitals. The State Insane Asylum is also located here. The city is an important industrial center. It is surrounded by a rich agricultural and dairy farming country, and the growing of hops is an important industry in the surrounding district. In 1914, Utica ranked eighth in industrial importance among the cities of the State. There were over 300 establishments, with a product valued at nearly $35,000,000. The industries include the manufacture of men's clothing, knit goods, woolen goods, heating apparatus, farm implements, paints, fire extinguishers, automobile parts, saddlery and harness, cutlery, etc. The assessed real estate value in 1919 was $87,795,495. The net funded debt was $2,876,722.

History. — During the Revolutionary period it was a frontier trading post, and the site of Fort Schuyler. It is a part of the original tract of 22,000 acres which the king granted to William Crosby, the colonial governor in 1734. Utica was settled by colonists from England and New England. It was incorporated a village in 1798, and chartered a city in 1832. Pop. (1910) 74,419; (1920) 94,156.

UTICA, an ancient city of north Africa; 20 miles N. W. of Carthage; originally founded as a Phœnician colony in 1101 B. C. Its ruins include an amphitheater, an aqueduct, and the remains of quays; for a bay then carried the sea (now nearly 10 miles distant) to the site. During the third Punic war Utica submitted to Rome, and became the capital of the province of Africa. Afterward it was the see of a bishop, till its destruction by the Arabs.

UTILITARIANISM, that theory of life which represents happiness as the only ultimate end to be devised and sought after—not necessarily the happiness of the individual, but that of the human race as a totality, and "even as far as possible of the sentient creation"—in Bentham's phrase "the greatest number."

With Jeremy Bentham, the inventor of the term the "greatest happiness of the greatest number," as the end of all true moral action, Utilitarianism takes its more modern shape. "Nature," he said, "has placed mankind under the government of two sovereign masters, Pain and Pleasure. It is for them alone to point out what we ought to do." In J. S. Mill Utilitarianism assumes its present, which may be safely said to be its highest, form. There, the happiness of the race is announced as an end to be pursued by the individual, even though he should be obliged to renounce his own in its attainment. A place is found for the martyr's effort, but that effort must be in accordance with the great principle of Utilitarianism, or it is worse than useless. Moreover, happiness is here no low or degrading conception, for there is quality as well as quantity in pleasures, and a lower pleasure must yield to a higher—the senses to the intellect, the body to the mind. Those who have had experienced of both may be taken as judges of the question. They have uniformly given the palm to the higher pleasures, and from their decision "I apprehend there can be no appeal." By careful moral education the conscience of the individual is to be so developed that its force in the direction of right action will be all-powerful.

That Utilitarianism is a theory of great plausibility, and that it can urge a great deal in support of its position, is evident from the preceding historical sketch. It is, so to speak, a self-contained theory; it does not require to go beyond the ob-

vious facts of existence to support its claims; it is plain, simple, and direct; it affords an easy and safe rule for the solution of all disputed questions of morals; and it is in obvious agreement with a vast number of the most patent facts of life. Many arguments have been employed against Utilitarianism. It has been urged: (1) That our powers have various ends, how then can happiness be the end of them all? (2) That all actions producing happiness are not regarded as moral actions. All actions producing pain are not wrong actions. (3) That pain may be used as a means to good, but we must not do evil that good may come of it. (4) That we cannot always calculate beforehand whether the effects of an action will be good or bad. Human life is too complex, and the knowledge an individual has of it is too small to allow him to judge with perfect certainty. Besides, men will take different views of such questions, and thus the moral standard will at best be but a fluctuating one. These objections have been more or less effectively met by the advocates of Utilitarianism, but the gravest objection to the doctrine is (5) that it has no proper theory of duty—the word "right" has no deep true meaning in the system.

UTOPIA, the name given by Sir Thomas More to the imaginary island which he makes the scene of his famous political romance "The Ideal Republic, Which Is the New Island of Utopia." More represents this island as having been discovered by Raphael Hythloday, a companion of Amerigo Vespucci, but it of course is England, its capital Amaurote, London. Its laws and institutions are represented as described in one afternoon's talk at Antwerp, occupying the whole of the second book, to which, indeed, the first serves but as a framework. More's romance, or rather satire, obtained a wide popularity, and supplied (though incorrectly enough) the epithet Utopian in all impracticable schemes for the improvement of society.

UTRECHT, an important town of Holland; capital of a province of the same name, 23 miles S. E. of Amsterdam. It is pleasantly situated on the Old Rhine, is traversed by two canals crossed by numerous stone bridges, and is surrounded by strong forts. The town is well built, and has several squares, promenades, a government house, a Protestant cathedral (a fine Gothic building), mint, handsome town hall, palace of justice, etc. Educational establishments include a well-equipped university, a veterinary school, musical college, and schools for drawing and architecture. Utrecht is the central point of the Dutch railway system, and carries on an extensive trade in grain and cattle, and in the manufactures of the place, which include Utrecht velvet, carpets, floor cloth, cottons, linens, chemicals, etc. Utrecht is the oldest town of Holland and was called by the Romans *Trajectum ad Rhenum*, that is "Ford of the Rhine," later *Ultra-trajectum*. Pop. about 120,000. The province of Utrecht has an area of 534 square miles; pop. about 375,000. It is generally flat, is well watered by the Rhine, Vecht, Amstel, etc., and is better suited for dairy farming and stock rearing than for corn growing.

UTRECHT, PEACE OF, a series of separate treaties agreed on at Utrecht by the powers which had been engaged in the war of the Spanish Succession. On April 11, 1713, the States-General, Prussia, Portugal, and Savoy, signed separate treaties with France. The emperor refused to accede to the peace, and his differences with France were subsequently adjusted by the treaties of Rastadt and Baden in 1714. By the treaty with England, France, among other things, recognized the Hanoverian succession, engaged never to unite the crowns of France and Spain, and ceded to England Nova Scotia, Newfoundland, St. Kitt's and Hudson Bay and Straits. Gibraltar and Minorca were also ceded on behalf of Spain. Holland retained the Spanish Netherlands till a barrier treaty was arranged with Austria. Louis XIV. recognized the title of the King of Prussia, who received a part of Spanish Guelderland, and the sovereignty of Neufchâtel in Switzerland, while renouncing the principality of Orange. Savoy and Nice were restored to the Duke of Savoy, who was recognized as presumptive heir to the Spanish monarchy, and received the title of king. Philip V. was not recognized till the conclusion of these treaties, but France treated for Spain and formal treaties corresponding with those with France were afterward signed with that power.

UVULA, a small fleshy protuberance which hangs at the middle of the posterior margin of the soft palate. In the case of sore throat, it frequently becomes enlarged and inflamed, and is to be treated by the application of stimulants and astringents in gargles.

UVULARIA, a genus of plants, order *Liliaceæ*. The mealy bellwort, *U. perfoliata*, is a handsome, smooth plant, found in woods in the United States and Canada; stem 10-14 inches high, passing through the perfoliate leaves near their bases, and dividing into two branches at top; flowers pale-yellow.

V

V, v, the 22d letter, and the 17th consonant of the English alphabet. It represents a labial or labio-dental consonant sound, and is produced by the junction of the lower lip and upper teeth, as in ov, eve, vain. The sound of v differs from that of f, which is produced in the same way, in being voiced, while that of f is breathed. Both v and f are also continuous consonants, and also belong to the class of the spirants. V in Middle English is commonly written u in MSS., and conversely u sometimes appears as v, most frequently at the beginning of words, and especially in the word vs, vse, vp, vnto, vnder, and vn-, used as a prefix. As noted under U, u and v were formerly the same letter, and in dictionaries and alphabetical lists words beginning with U and V were, up till a comparatively recent date, combined. [U.] The Latin v, or rather consonant u, was probably pronounced as w; as in *vespa* = wasp. A very large proportion of the words which begin with v are of French or Latin origin, only vane, vat, vinewed, and vixen being English. The letter v did not exist in Anglo-Saxon, its sound being represented by f, as in *heofon*=heaven, of=of (*ov*). [F.] By this may be explained the change of consonant in the plurals in such words as thief, plural thieves, wolf, plural, wolves, etc. V frequently replaces f, as in vat = Middle English fat; vetches = Middle English fetches (at the present day so pronounced in the Midland counties), etc. In the dialects of the S. of England v is still commonly used where other dialects have f: as vo = foe, vinger = finger, etc. V in some Romance words represents ph, as vial = phial, Middle English visnomy = physiognomy, etc. V has been changed to (1) w in periwinkle = French *pervenche*, Latin *perivinca;* (2) to m in malmsey=Middle English malvesie, Old French, *malvoisie*. In vulgar speech, especially of Londoners, v is sometimes used for w, and, conversely, w for v; as vell for well, wery for very. V never appears as a final letter in English (though a final v sound often occurs), nor is it ever doubled.

V as a symbol is used: (1) As a numeral: For 5, and with a dash over it for 5,000. (2) In chemistry: For the element vanadium. (3) In heraldry: For vert, in the tricking of arms with a pen and ink. (4) In law: For *versus* (Latin) =against; as John Doe v. Richard Roe. (5) In physics: For velocity or volume. (6) In music: As an abbreviation of violino, violini, voce, volta, etc. (7) In finance: For $5; as I'll give a V for it (from the letter V on the bill). (8) In electrics: As a symbol for volt.

VACATION SCHOOLS, in the United States, schools conducted for the purpose of teaching useful occupations to the poor children of large cities. The idea originated in Boston, where the first school was held during six weeks of the summer of 1885. From Boston the movement spread to New York, Chicago, and other large cities and in 1920 practically every large city in the United States instituted such schools in its system.

VACCINATION, the act or art of vaccinating; the introduction of vaccine matter into the human frame with the view of protecting it against smallpox, or rendering that disease less formidable. It was at first supposed that the cowpox had arisen by the transmission to the cow of a disease in the horse called "grease," the purulent matter of which was largely employed by Jenner and others for vaccinating purposes, at first after it had been passed through the cow and afterward by direct transmission. Its employment has long since been abandoned. The cowpox is not produced in the human frame by effluvia; actual inoculation is required. When vaccine lymph is introduced into the arm of an infant, by one or more punctures of a lancet, no noticeable effect is

discernible for two days. Then a slight papula arises, which, on the 5th or 6th day, becomes of a bluish color and vesicular, with a raised head and a central cup. On the 8th day it reaches full development, and an inflammatory areola appears, which spreads with the extension of the vesicle for two more days. Then a crust or scale is produced in the center of the vesicle, and gradually extends till it covers it in every part. On the 14th or 15th day the scale becomes hard and brown; it next contracts, dries, and blackens, till, between the 20th and the 25th day, it falls off, leaving a permanent circular, depressed, and foveated cicatrix. Unless it possesses all these characters, and specially unless foveation be present, vaccination is imperfect, and cannot be relied on as a prophylactic against smallpox. See VACCINE THERAPY.

VACCINE THERAPY, BACTERIA THERAPY, the treatment and prevention of disease by inoculation with the virus of the bacteria causing the disease. It was first practiced by Dr. Edward Jenner toward the end of the 18th century. He made the discovery that persons inoculated with cowpox were thereby rendered immune against smallpox. Since that time the practice has been extended to several other diseases, including typhoid fever, asthma, and pneumonia, and it is claimed that in most cases the results have been remarkably successful. Care should be taken to distinguish between SERUM THERAPY (*q. v.*) and vaccine therapy. In the former, anti-toxins are injected into the blood to assist in the destruction of the toxins which cause the diseased condition. In the latter, bacteria themselves, or their products, are introduced into the blood, the theory underlying the practice being the stimulation of the natural healing powers of the body, by the formation of anti-toxins, thus producing greater resistance to disease. Human serum possesses what is known as opsonic action on bacteria, which means that it renders them more easily destroyed by the white corpuscles in the blood. The power which the serum of a patient displays toward bacteria is known as the "opsonic index" (see OPSON) and it has been found that when the opsonic index is rising, favorable results can be produced by vaccine injection, but when the opsonic index is falling, it is advisable to discontinue injections.

VACHELL, HORACE ANNESLEY, an English novelist, born in 1861. He was educated at Harrow and at the Royal Military College, Sandhurst. He became a lieutenant in the Rifle Brigade, in 1883, but later devoted himself to writing. His publications include "Romance of Judge Ketchum" (1894); "Model of Christian Gay" (1895); "Quicksands of Pactolus" (1896); "An Impending Sword" (1896); "A Drama in Sunshine" (1897); "The Procession of Life" (1899); "John Charity" (1900); "Life and Sport on the Pacific Slope" (1900); "The Shadowy Third" (1902); "The Pinch of Prosperity" (1903); "Brothers" (1904); "The Hill" (1905); "The Face of Clay" (1906); "Her Son" (1907); "The Waters of Jordan" (1908); "The Paladin" (1909); "The Other Side" (1910); "John Verney" (1911); "Jelf's" (1912); "Blinds Down" (1912); "Bunch Grass" (1912); "Loot" (1914); "Quinney's (1914); "Spragge's Canyon" (1914); "Searchlights" (1915); "The Case of Lady Camber" (1915); "Who Is He?" (1915); "The Triumph of Tim" (1916); "Fishpingle" (1916); "Humpty Dumpty" (1917); "Mrs. Pomeroy's Reputation" (1918); "The Soul of Susan Vellam" (1918).

VACHEROT, ETIENNE (väsh-rō'), a French philosopher; born in Langres, France, July 29, 1809; was educated at the Paris Normal School, where he succeeded Cousin as Professor of Philosophy in 1839; was dismissed for refusing to take the oath of allegiance when Louis Napoleon became emperor; imprisoned for a year for censuring the Napoleonic system; succeeded Cousin in the Academy of Moral Sciences in 1868; was one of the mayors of Paris during the siege. Was elected to the Assembly, and was one of the three deputies of Paris who voted in favor of making peace with Germany. He wrote a "Critical History of the School of Alexandria" (3 vols. 1846-1851); "Democracy" (1859); "Metaphysics and Science" (2 vols. 1858); "Essays in Critical Philosophy" (1864); "Religion" (1868); "Science and Conscience" (1870); The External Policy of the Republic" (1881); "The New Spiritualism" (1884). He died in Paris, July 30, 1897.

VACUUM, in physics, a portion of space void of matter. The possibility of the existence of a perfect vacuum has been a favorite subject of discussion among metaphysicians; and that the negative view was popular is indicated by the historical phrase "the vacuum which nature abhors." Descartes asserted that if the contents of a hollow vessel were taken out without anything entering to fill its place the sides of the vessel would be in contact. This assertion, however, is based on the dogma that the only essential property of matter was its

extension; that, in other words, matter was indistinguishable from space. Such inquiries, however, can lead to nothing definite. The experimental philosopher is obliged to recognize the practical impossibility of obtaining a perfect vacuum. The so-called Torricellian vacuum, which exists above the mercury column of a barometer, is really filled with mercury vapor probably mixed with a small percentage of air. The very action by means of which the air pump produces its vacuum shows that there can never be an absolute void—a little air always remaining behind. Andrews, following up a suggestion of Davy, obtained remarkable vacua by first pumping in carbonic acid so as to expel as far as possible the air, and then after ordinary exhaustion leaving the carbonic acid to be taken up by moistened caustic potash which has been previously placed in the receiver. In this way Andrews removed all but $\frac{1}{350,000}$ of the gas originally present, whereas by ordinary air pump action only $\frac{1}{118}$ of the gas can be removed. Frankland, Gassiott, Crookes, Dewar, and others, have devised various improvements. Dewar takes advantage of the property of the gases to condense on the surface of solids in a remarkably ingenious way. A piece of carbon, placed in the vacuum vessel, is kept heated while the vessel is being exhausted. After the exhaustion is completed as far as possible, the carbon is allowed to cool so as to permit the small quantity of gas present to condense in its pores. A gentle heating of the carbon at once releases a quantity of the gas, so that this method is invaluable in the study of electric discharges through rarefied gases, since the rarefaction can be so easily altered at will.

VACUUM CLEANER, a mechanical device for getting rid, by means of air suction, of dirt and dust from the floors and other parts of a house. It consists in the main of a nozzle which is run over the area that needs cleaning, a pipe connecting the nozzle with a separator where the dust and dirt are removed from the air, and an exhausting apparatus for producing a vacuum. The nozzles are in such shapes and sizes as the work may require. Some vacuum cleaners are operated by current which is derived from connection with a lamp socket. Another of a more extensive kind, mounted on a carriage and driven by an internal combustion engine, is stationed outside the building to be cleaned and the hose passed through the window. The third type is located as a rule in the basement of a building and is connected by permanent pipes with outlets to which nozzles and hoses may be attached in different parts of the buildings.

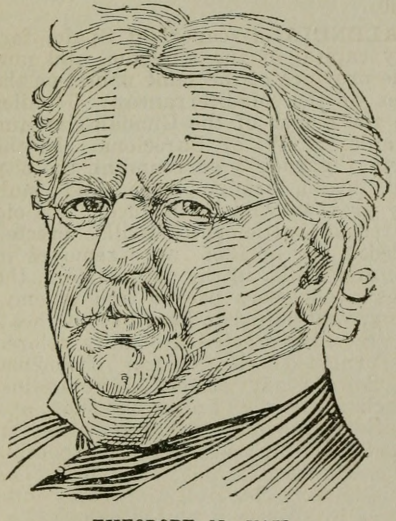
VAGINA, the membranous canal leading from the uterus or womb to the external genitalia. The vagina in lower mammals, such as the *Ornithorhynchus*, opens into cloaca, while in the kangaroos and other *Marsupialia* it opens into a canal named the uro-genital canal, which receives the efferent ducts of the urinary organs. In higher quadrupeds the vagina is distinct both from the rectum and the urinary ducts. In the human subject it attains a length of about four inches measured along its anterior wall and six inches measured on its posterior surface. It lies between the bladder and rectum; constricted at its commencement it becomes dilated toward its uterine end. The coats of the vagina number three—an external or muscular layer, a layer of erectile tissue, and an inner or mucous layer. The mucous layer is thrown into folds or rugæ, which permit the distension of the canal in the process of parturition.

VAIL, ALFRED, an American inventor; born in Morristown, N. J., Sept. 25, 1807; was graduated at the University of the City of New York in 1836, and in 1837 became associated with Samuel F. B. Morse in his experiments for the purpose of perfecting a scheme of telegraphy. His mechanical knowledge applied to the experimental apparatus resulted in the first available Morse machine. He invented the combination of the horizontal-lever motion to actuate the style; devised the alphabet of dots, spaces and dashes which it necessitated; and in 1844 constructed the automatic lever and grooved roller which embossed on paper the characters which he originated. He was appointed assistant superintendent of the telegraph line constructed between Baltimore and Washington in 1843, and on the completion of the system, in 1844, was stationed at Baltimore, where he invented the finger key and received the first message from Washington. He died in Morristown, N. J., Jan. 18, 1859.

VAIL, CHARLES H., an American clergyman; born in Tully, N. Y., April 28, 1866; was graduated at St. Lawrence University in 1892; studied theology and was ordained in the Universalist Church; was pastor of All Souls' Church, Albany, N. Y., in 1893-1894. In the latter year he accepted the pastorate of the First Universalist Church in Jersey City. In 1901 he was an unsuccessful candidate for governor of New Jersey on the Social Democratic ticket. His publications include: "Modern Social-

ism" (1897); "National Ownership of Railways" (1897); "Scientific Socialism" (1899); "The Industrial Evolution" (1899); "Mission of the Working Class" (1900); "Socialism: What It Is and What It Is Not" (1900); "The Socialist Movement" (1901); "The Trust Question" (1901); "Militant and Triumphant Socialism" (1913); etc.

VAIL, THEODORE NEWTON, an American capitalist; born in Carroll co., Ohio, in 1845. He was educated at Morristown (N. J.) Academy. After studying medicine for 2 years he became in 1873 assistant superintendent of railway mail service at Washington, assistant general superintendent in 1874 and general superintendent in 1875. From 1878 to 1887 he was in the telephone business. After traveling for some years he took up farming in Vermont in 1893, and in 1896 became interested in electrical enterprises in Argentina, introducing an electrical street railway system in Buenos Aires and installing telephone systems in the principal Argentine cities. In 1907 he became president of the American Telegraph and Telephone Company, serving in this capacity until he died on April 15, 1920. He was an officer and director in many corporations in the United States and England, and was a member of many scientific and other societies. He received honorary degrees from Dartmouth, Middelbury College, Princeton, Harvard and the University of Vermont.



THEODORE N. VAIL

VAISHNAVA (vīsh'nä-väz), a primary religious sect of the Hindus, who adore Vishnu in preference to, if not to the exclusion of, the other persons of the Hindu triad. To carry individual preference to this extent is not considered orthodox, and many of those who do so have united themselves into monastic bodies, which, drawing their devotees from various castes, virtually merge them in a new one—that of the Sectarian brotherhood. Horace Hayman Wilson divided the Vaishnavas into the following sections: (1) Rámánujas, Sri Sampradáyís, or Sri Vaishnavas; (2) Rámánandis, or Rámâvats; (3) Kabír Panthís; (4) Khákís; (5) Malúk Dásís; (6) Dádú Panthís; (7) Ráya Dásís; (8) Senáís; (9) Vallabhácháris, or Rudra Sampradáyís; (10) Mírá Báís; (11) Madhwácháris or Brahma Sampradáyís; (12) Nímávats, or Sanakádi Sampradáyis; (13) the Vaishnavas of Bengal; (14) Radhá Vallabhís; (15) the Sakhí Bhávas; (16) Charan Dásis; (17) Harischandís; (18) Sadhná Panthís; (19) Mádhavis; and (20) Sannyásís, Vairágís, and Nágas.

VALAIS (välā') (German, Wallis), a frontier canton of Switzerland; bounded on the N. by the cantons of Vaud and Bern, and on the S. by Italy; area, 2,027 square miles; pop. about 130,000. It forms one long and deep valley, included between two of the loftiest mountain chains of Europe—the Pennine and the Bernese Alps—and is drained by the Upper Rhône, which, rising at its N. E. extremity, falls at the W. boundary of the canton into the Lake of Geneva. The greater part of the surface consists of barren mountain slopes—in their higher elevations covered with the greatest of the Swiss glaciers. The forests and pasture-lands supply the inhabitants with their chief occupations. The heat at the bottom of the valley, where there is a strip of corn land, is intense in summer, and Indian corn and the vine are grown with great success. The Grimsel and Gemmi passes connect the E. part of the valley with German Switzerland; and the Great St. Bernard and SIMPLON (*q. v.*) passes connect it with Italy. Sion and Martigny are the chief towns.

VALDAI HILLS (väl'dī), a range of hills in western Russia, averaging about 300 feet in height, but rising in Mount Popovagora to 1,080 feet. They are well wooded, and contain the sources of the Volga, Dnieper, and Düna.

VALDENSES. See WALDENSES.

VALDÉS, ARMANDO PALACIO (väl-dās'). See PALACIO VALDÉS.

VALDÉS, JUAN DE, a Spanish theologian, reformer and writer, born in

Cuenca, Castile, about 1500. In 1528 he wrote "Diálogo de Mercurio y Caron," a treatise severely criticising the Roman church. Fearing the Spanish Inquisition, Valdés left the country and settled in Naples, spending also some time in Rome and Bologna. In 1533 he returned to Naples, where he resided until his death in 1541. Although a Catholic, he was a strong advocate of doctrines usually identified with Luther and his followers.

VALDIVIA, a town in the S. of Chile; capital of a province of the same name; on the Valdivia river, 9 miles from its mouth, with a safe and roomy harbor. The entrance to the river is fortified. The town is built on level ground, and is embosomed in apple orchards, surrounded by the native forest. It has an active coasting trade, chiefly with Valparaiso. Valdivia was founded in 1551 by Pedro de Valdivia, one of Pizarro's lieutenants, who named it after himself, and it was at one time a place of great wealth. The province of Valdivia has an area of 8,647 square miles. Besides splendid forests it has large upland pastures, and deposits of coal are known to exist within it. Pop. (1918) 26,091.

VALDIVIA, PEDRO DE, a Spanish military officer; born in Estremadura, Spain, about 1498; was on military service in Flanders; removed to Venezuela in 1534; and two years later joined Pizarro against the Indians in Peru. Under that conqueror he aided in the defeat of Almagro at Las Salinas. Later he led 150 Spanish and several thousand Indians in an expedition against Chile, which had been ceded by Charles V. to Pedro Sanchez de Hoz. After defeating a large force of Indians he established Santiago on Feb. 12, 1541. Subsequently the Spaniards were many times attacked by the Indians and were cut off from Peru. In December, 1543, re-enforcements arrived and the colony thereafter prospered. In September, 1544, Valparaiso was founded, and in 1546 Valdivia marched into the Araucanian district, and in a great battle conquered the Indians. In 1547-1549 he joined Gasca, the royalist, against Pizarro, whom they defeated. In 1550-1552 he established Concepcion, Valdivia, and other places. A wide uprising of the Indians occurred in December, 1553, and while Valdivia was endeavoring to put down this revolt he was captured and put to death, it is supposed, on Jan. 1, 1554.

VALDOSTA, a city of Georgia, and the county-seat of Lowndes co., about 150 miles southwest of Savannah, on the Atlantic Coast Line, the Georgia and Florida, and other railroads. There are manufactories of buggies, cloth, cottonseed oil, fertilizers, lumber products, naval stores, etc. It is the center of a prosperous agricultural region, raising cotton, fruit, and general farm products. The South Georgia Normal College, high schools, and a Carnegie library are among its prominent educational features. Pop. (1910) 7,656; (1920) 10,783.

VALENCE (vä-longs), a town of France, capital of the department of Drôme; on the Rhône; 57 miles S. of Lyons. It is surrounded by orchards, vineyards and woods; has an important trade; and manufactures of silk goods, metal goods, etc. Its principal edifices are the cathedral, with the tomb of Pope Pius VI., barracks, citadel, court house, prison and theater. It has a communal college, a public library, school of artillery, school of design, dock for shipbuilding, cotton printing and dyeing establishments, etc. Pop. commune, about 30,000.

VALENCIA, a seaport of Spain, formerly capital of the kingdom, and now of the province of the same name; on the shores of the Mediterranean; 3 miles from the mouth of the Guadalaviar and 200 miles S. W. of Barcelona. In the Huerta ("garden") surrounding the city carob, citron, orange, palm, and mulberry grow in wild luxuriance. The old picturesque battlemented walls, erected by Pedro IV. in 1356, were removed in 1871; and while, in the old quarters, the houses are closely packed and gloomy-looking, well suited to keep out the heat, those recently erected are gaily colored and furnished with courts freshened with flowers and cooled by fountains. Valencia is the see of an archbishop, and its cathedral, which was commenced in 1262, classical in the interior, and Gothic on the exterior, is 350 feet long. The church of the Colegio de Corpus is quite a museum of pictures by Ribalta. The picture gallery contains chiefly the productions of the Valencian school (Juanes, the Ribaltas, Ribera, etc.). The university has a library of over 50,000 volumes. The custom house, dating from 1758, is now a cigar factory. Silk spinning and weaving are extensively carried on; there are also manufactures of cloths, hats, glass, linen, leather, cigars, and Valencia tiles for flooring. The exports are mainly grain, silk, rice and fruits. Pop. about 245,000. Valencia, or Valentia del Cid, dating from the 2d century B. C., was destroyed by Pompey, taken by the Goths A. D. 413, by the Moors in 715, and by the Cid in 1094. The union of Ferdinand and Isabella brought it under the Castilian crown.

Suchet captured the city in 1812. The old kingdom of Valencia, now subdivided into the three modern provinces of Valencia, Alicante and Castellon de la Plana, comprises a tract of country in the E. of Spain, washed by the Mediterranean, and extending from Catalonia to Murcia. It has a hot but fine climate, a fertile soil, mineral wealth and many industries.

VALENCIA, the capital and most important city of Carabobo, Venezuela; in the Aragua valley, 24 miles S. of Puerto Cabello; altitude 1,824 feet above sea-level. It is the second city of Venezuela in population and importance, and is the trade center of a large section handling sugar, hides, coffee, cocoa, etc. Here are electric lights, beautiful parks and squares, regular streets, a National College, a cathedral, etc. In the vicinity are celebrated hot springs. Valencia was established in 1555. After the separation from Colombia the first Venezuelan Congress met here. Pop. about 55,000.

VALENCIA, LAKE OF, a body of water in Venezuela, 2 miles from Valencia and near the Caribbean Sea; length, 22 miles; average breadth, 4 miles. It contains many islands and is the outlet of the Aragua river.

VALENCIENNES (vä-long-syen'), a fortified city of France, in the department of Nord; at the junction of the Rhondelle and the Scheldt. It is noted for its manufactures of lace. It contains a citadel, a fine town hall, a communal college, civil and military hospitals, a library, museum, theater, arsenal, etc. Before the World War its industries were varied, comprising manufactures of batiste, linens, lawns, printed muslins, lace, beet sugar, gold and silver tissues, toys and leather. It also had foundries, rolling-mills, distilleries, glass works and dye works. It was taken in 1793 by the English and Austrians after a siege of six weeks. It was the birthplace of Froissart, Watteau and Pujol. The city was taken by the Germans in 1914, and was held by them during the World War. Pop. about 35,000.

VALENS, FLAVIUS, Roman emperor of the East; born in Pannonia, in 328; declared emperor of the East by his brother Valentinian I., who had already been elected emperor. The chief event of his reign was the war with the Goths under Athanaric, which lasted during the whole of Valens' reign. The Goths were several times defeated, and sued for peace, which was granted them (370). In 377 the Goths, driven S. by the Huns, asked and received permission to settle on Roman territory. Irritated by the treatment they received at the hands of the imperial officials, they soon took up arms, and in 378 defeated Valens and destroyed the greater part of his army. Valens was never seen or heard of afterward.

VALENTIA, or **VALENCIA**, a small fertile island off the S. E. coast of Ireland, belonging to County Kerry, about 5 miles long by 2 miles broad. It has slate and flag quarries, and productive fisheries. The British Atlantic telegraph cables to Newfoundland start from Valentia, and there is here a lighthouse.

VALENTINE, a sweetheart or choice made on St. Valentine's day.

According to the legend, St. Valentine was beheaded on Feb. 14, at Rome, under Claudius. The old notion was that birds began to couple on that day, and hence arose the custom of young persons of both sexes choosing each other as "Valentines" for the ensuing year by a species of lottery, and of sending love missives to each other.

Also a letter or other missive sent by young persons of both sexes to each other on Valentine's day; a printed missive of an amatory or satirical nature, generally sent by post anonymously. Some valentines are highly ornamental and artistic, while others (commonly called "comic valentines") are caricatures, designed to reflect on the personal appearance, habits, character, etc., of the persons to whom they are addressed. The practice of sending valentines by mail appears to be diminishing year by year, the later practice, confined almost exclusively to children, being to insert them under the door of the person to whom they are addressed, and then to knock or ring the door bell and hurry away. In the various cities of the United States many millions of hideous caricatures thus change hands each year.

VALENTINIAN I., a Roman emperor (364-375); born of humble family in Cibalis, Pannonia, in A. D. 321. By his capacity and courage he rose rapidly in rank under Constantius and Julian, and on the death of Jovian was chosen as his successor (Feb. 26, 364). He resigned the East to his brother Valens, and himself governed the West with watchful care down to his sudden death at Bregetio, Nov. 17, 375, brought on by a fit of passion. By his first wife he had one son, Gratianus, and by the second, Justina, another son, Valentinian II., and three daughters, one of whom, Galla, became the wife of the Emperor Theodosius I.

VALENTINIAN II., a Roman emperor; born A. D. 372; received from his

elder brother, Gratianus, the provinces of Italy, Illyricum, and Africa, as his share of the Western Empire. During his long minority the Empress Justina administered the government; and about three years after her death Valentinian was murdered by Arbogastes, the commander-in-chief of his army (392).

VALENTINIAN III., Emperor of the West; grand-nephew of the preceding, being the son of Constantius III. by Placidia, the daughter of Theodosius the Great and Galla; born about A. D. 419, and was seated on the throne of the West by Theodosius II., emperor of the East, in 425. Valentinian was a weak and contemptible prince, and never really ruled during the 30 years that he sat disesteemed and unhonored on the imperial throne; his mother, Placidia, governed till her death in 450, and was succeeded by the eunuch, Heraclius, one of those malignant fribbles who swarmed around the throne of the falling empire. His treatment of Bonifacius made the latter throw himself into the arms of GENSERIC (*q. v.*), chief of the Vandals, and thus lost Africa to the empire. Aëtius, the buttress of his empire, he stabbed to death in a fit of envious jealousy (454), but next year was himself slain by Maximus, whose wife he had ravished.

VALERIAN (VALERIANUS, PUBLIUS LUCINIUS), a Roman emperor; born about 190. He was proclaimed after the death of Gallus in 253. He was defeated in the East by Sapor, King of Persia, and is supposed to have been flayed alive in 260.

VALERIAN, the type genus of *Valerianaceæ;* an order of herbs of rarely shrubs belonging to the division of monopetalous dicotyledons having the stamens arising from the petals. The order is distinguished from its congeners by the opposite leaves; small irregular flowers in which the corolla lobes are imbricate; stamens, one to three or five, free; ovary one to three celled, one cell one-ovuled; ovule pendulous; seeds exalbuminous. It contains 12 genera and about 190 species, distributed through Europe, northern Africa, temperate Asia, and northwestern America — unknown in Australia, and only one species south African. The properties are aromatic, antispasmodic, sometimes stimulant. The genus *Valeriana* numbers 130 species. Of these, *V. officinalis*, ranging across northern and central Europe and Asia to Japan, is a common British plant. Its rootstock has long been valued as an antispasmodic, and is successfully employed in hysteria. It has a penetrating odor, and a bitter, acrid, somewhat aromatic taste; when distilled with water it yields a volatile oil and valerianic acid. Cats have a strange liking for the odor, and it exercises a remarkable intoxicating or stimulating power over them; the plant is sometimes called cats' valerian. The roots of *V. celtica* are used by Eastern nations as a substitute for spikenard for aromatizing their baths, and those of *V. edulis* as an article of food by the Indians of northwestern America. The red valerian (*V. pyrenaica*), a native of southern France and Spain, has become naturalized in parts of Great Britain, and several other species are commonly grown in gardens. The word valerian is from Latin *valere*, "to heal," and one of the names of *V. officinalis* is "all-heal."

VALERIC, or VALERIANIC ACID, $C_5H_{10}O_2$, an organic acid present in valerian root, angelica root, in the berries of *Viburnum opulus*, and probably in many other plants. It is prepared artificially by oxidation of ordinary amyl alcohol ($C_5H_{12}O$), two atoms of hydrogen being removed and one of oxygen added. The most advantageous method of effecting the oxidation is to treat the amyl alcohol with a mixture of sulphuric acid and potassium dichromate. After a series of operations the acid separates as an oily liquid lighter than water and having the composition $C_5H_{10}O_2H_2O$. The water is driven off by distillation, and the pure acid obtained as a mobile colorless oil. It has a sharp acid taste, reddens litmus, and burns with a bright but smoky light. It has a density of .973, and boils at 175°. It forms valeriates with metallic oxides, but its compounds are not of much importance. Ethyl valerate ($C_2H_5C_5H_9O_2$) is formed by passing hydrochloric acid gas into an alcoholic solution of valeric acid.

VALETTA, a strongly fortified seaport and capital of Malta; on the N. E. coast of the island; on an elevated neck of land, with a large and commodious harbor on each side. The town has wide streets paved with lava, spacious squares, and fine quays, lined with elegant buildings. From the inequality of the site the communication between the different streets is maintained by flights of steps. The cathedral, built in 1580, contains the tombs of the Knights of Malta or of St. John, and in a chapel are the keys of Jerusalem, Acre and Rhodes. Other notable buildings are the governor's residence, formerly the palace of the grandmasters; the library, museum, university, and the military hospital. The dockyard is capable of admitting the largest men-of-war. Some shipbuilding

and various other industries are carried on, and the trade includes grain, wine, fruits, cotton, and other manufactures, coals, etc. The mail steamers for Alexandria, Constantinople, etc., call here, and it is the chief station of the British fleet in the Mediterranean. Pop. about 25,000. See MALTA.

VALETTE, JEAN PARISOT DE LA, a French military officer; born in 1494. He came of a noble family of Toulouse, entered the order of the Knights of St. John, and was elected grand-master of that order in 1557. His life thenceforward is a series of exploits in warfare with the Turks, culminating in his famous defense of Malta, lasting from May 18, 1565, till Sept. 8. The Turks had 159 war ships and 30,000 men; the defenders were 8,500 men, with 700 knights, and unsupported held the fortifications heroically in spite of awful loss and privations, till the approach of a Neapolitan fleet caused the Turks to raise the siege. The veteran commander died Aug. 28, 1568. He built Valetta.

VALHAL, VALHALLA, or **WALHALLA,** in Northern mythology, the chief hall in Asgard, the banqueting house of the Æsir, there entertained by Odin along with the Valr or Einherjar chosen by the Valkyrjur. Valhal has 540 doors, through each of which 800 Einherjar may pass abreast. In front is the grove Glasir, whose leaves are golden. W. of the door is a great wolf, and overhead a crouching eagle. Gleaming swords light up the hall. The roof trees are spears, the roof itself is formed of shields, and the seats are covered with shirts of mail. The Einherjar eat the flesh of the boar Sæhrîmnir, which is cooked every day, and at night is restored whole as before; and drink mead, which flows from the udder of the goat Heidrun. Every day the Einherjar, as soon as dressed, array themselves in armor, and go forth into the fields to fight and fell one another. This is their pastime; as it draws to breakfast time they ride back to Valhal, where they sit down to feast. After Odin's Valhal is named the Walhalla or Temple of Fame built by King Ludwig I. of Bayern at Donaustauf, near Regensburg.

VALLA, LORENZO DELLA, an Italian humanist; born presumably in Rome in 1407; studied Greek and Latin under the leading masters; and having failed to succeed to an uncle's post of apostolic secretary, took orders (1431), and accepted the chair of Latin eloquence at Pavia. About this time his "Elegance of the Latin Language" (Rome, 1444) established him as the supreme authority on Latin style; and having lectured successively at Milan, Genoa, and Florence, he received from Alfonso V. of Naples a private secretaryship along with the poet's crown (1437). The feud between Rome and Aragon made Alfonso glad to secure so fierce an opponent of the papal see as Valla, who in "The Forgery of the Donations of Constantine" (1440) assailed Pope and cardinals, and demolished a lie imposed upon Christendom for centuries. The storm excited by this treatise drove Valla awhile to Barcelona, but returning to Naples he continued his assaults, impeaching the Vulgate's Latinity, the authenticity of the Apostles' Creed, and of Christ's letter to Abgarus; and when cited before the Inquisition, declaring the Church knew nothing yet he believed with her. Pope Nicholas V., however, succeeding Eugenius in 1447, summoned Valla to Rome, and made him secretary; and he passed his remaining years in translating from the Greek, and in furious literary feuds with Poggio, Trapezuntios, and others among his compeers. He died in Naples, Aug. 1, 1457, leaving behind him Latin translations of Herodotus, Thucydides, and the "Iliad," "Notes on the New Testament," etc.

VALLADOLID, a city of Spain, in Old Castile, capital of the province of the same name (area, 2,922 square miles; pop. about 285,000); on the left bank of the Pisuerga, and on the Irun-Madrid railway, 102 miles N. W. of Madrid. It is a fortress of the first rank and the seat of an archbishop; has a cathedral founded in 1585 by Philip II.; many monasteries; a celebrated university founded in 1346, an institute, an Academy of Fine Arts, a museum containing many beautiful pictures and sculptures, a library, various seminaries and industrial schools, a theater, hospitals, poorhouse, etc. Of its "plazas" the most beautiful are the quadrangular Plaza Mayor, the octagonal El Ochavo, and above all the triangular Campo Grande, where bull fights, autos-da-fé, and other public spectacles used to be held, and where Napoleon is said to have reviewed not fewer than 35,000 men. The manufactures of Valladolid, which have much revived, are chiefly of cloth, iron, and leather. The old Roman town of Pintia is said to have been rebuilt in 625 by the Goths, but the name Valladolid was first applied to it after its recovery from the Moors about 1072. From this time till Charles V. transferred the court to Madrid, Valladolid was a favorite residence of the kings of Leon. It was the birthplace of Philip II. Pop. about 70,000.

VALLANDIGHAM, CLEMENT LAIRD, an American politician; born in

New Lisbon, O., July 29, 1820; was a member of Congress in 1858-1863, and during the Civil War was a strong friend of the Southern Confederacy. He was arrested in May, 1863, by United States troops, on a charge of uttering disloyal sentiments; was tried by court martial; and sentenced to confinement till the end of the war. This was afterward commuted to banishment to the Confederate lines; but, as he was not very cordially received there, he went to Canada. In the same year he was nominated as candidate for governor of Ohio, and was beaten by the largest majority ever given in that State. He was a member of the Democratic National Convention in 1864, at which General McClellan was nominated for the presidency. He died in Lebanon, O., June 17, 1871.

VALLEJO (väl-yā'hō), a city of Solano co., Cal.; on the N. E. shore of San Pablo Bay, at the mouth of Napa creek, and on the Southern Pacific and the San Francisco, Napa and Calistoga railroads; opposite Mare Island navy-yard, 27 miles N. N. E. of San Francisco. It has a large and safe harbor, accessible to the largest ships. Here are a high school, public library, Orphans' Home, banks, electric lights, waterworks, and several daily and weekly newspapers. The city has flour mills, shipyards, shoe factories, manufactories of steam engines, cement, boilers, elevators, etc. Pop. (1910) 11,340; (1920) 21,107.

VALLEY, in geology, a long depression or hollow on the surface of the earth, margined by ground more or less high. It may be on a vast scale of magnitude, as the bed of an ocean would be if upheaved sufficiently to become land, or it may be comparatively small but broad; or narrow, as a glen or a deep gorge, called by Americans a cañon or gulch. It may be surrounded by hills, or may constitute a depression crossing a country from sea to sea. Valleys of stratification are produced by the decay and removal of shale or other soft rocks, while the less destructible hard rocks remain. Other valleys have been excavated by rivers alone. Many valleys on low-lying plains adjacent to the sea have originally constituted river beds and banks, then through a depression of the land the ocean has gained access to them, constituting them estuaries; then again upheaval has made them land valleys. Other valleys have constituted the beds of old lakes. Valleys, resembling troughs, on table-lands are in many cases produced by the flexure of strata laterally, so as to constitute a series of elevations and depressions. A small number of valleys occurring high up mountain sides may constitute old craters of eruption.

In anatomy, a deep fossa separating the hemispheres of the cerebellum (called also vallecula). In architecture, the internal angle formed by the junction of two inclined sides of a roof.

VALLEYFIELD, a town in Beauharnois co., Quebec, Canada; on the St. Lawrence river and on the Grand Trunk and the St. Lawrence and Adirondack railways; 38 miles from Montreal. Near by is the head of Beauharnois canal, constructed past the rapids of St. Lawrence. The river here is crossed by a splendid railway bridge. The town contains a cathedral, a number of beautiful public buildings, and the residence of a Roman Catholic bishop. Pop. about 10,000.

VALLEY FORGE, a village in Chester co., Pa., on the Schuylkill river, and on the Philadelphia and Reading railroad; 24 miles W. of Philadelphia. It is noted as the place where Washington with about 11,000 troops went into winter quarters in December, 1777. It was here also that Baron Steuben became inspector-general of the army, and the treaty of alliance with France was announced, May 6, 1778. During the winter the American army suffered greatly from cold and hunger, and about half of the men were unfit for active duty. In 1893 the Pennsylvania Legislature acquired about 475 acres near Valley Forge as a public park and historic landmark. On Oct. 19, 1901, a monument was here unveiled by the Daughters of the Revolution in memory of the soldiers who died in camp during the winter of 1777-1778. Several States have also erected memorials to their soldiers.

VALOIS (vä-lwä'), **HOUSE OF**, a dynasty which ruled France from 1328 to 1589. In 1285 Philip III. gave the country of Valois (now in the departments of Oise and Aisne) to his younger son Charles, and on the extinction of the Capet dynasty in 1328 the eldest son of this Charles of Valois ascended the French throne as Philip VI., and founded the Valois dynasty, which was followed by the house of Bourbon.

VALPARAISO, a city and county-seat of Porter co., Ind.; on the Pennsylvania, the New York, Chicago and St. Louis, and the Chicago and Grand Trunk railroads; 44 miles E. of Chicago. It is in an agricultural section. Here are the Valparaiso University, the Northern Indiana Normal School, several National and State banks, and a number of daily and

weekly newspapers. The city has clock factories, machine shops, an iron foundry, etc. Pop. (1910) 6,987; (1920) 6,518.

VALPARAISO ("the vale of Paradise"), the chief seaport of Chile; in a province of the same name; (area, 1,775 square miles; pop. about 350,000); 90 miles W. N. W. of Santiago, the capital, with which it is connected by railway. It is built at the base of steep, bare hills about 1,600 feet high, and round the head of a bay which possesses good anchorage, but is exposed to S. winds, and therefore unsafe in winter. The streets are narrow and often steep, but are well paved, and some of them are traversed by tramways. The houses are substantial, and often elegantly decorated. The public buildings include a number of important educational and charitable institutions, besides churches and theaters. The city has been greatly damaged by earthquakes on various occasions (notably in 1822, 1829, 1851, and 1906), as well as by a bombardment by a Spanish fleet on March 31, 1866. The climate is good, but dry, little rain falling except during the three winter months. The annual mean temperature is 58°. The chief items of export are copper and copper ore, gold, silver, cereals, wood, hides, and tallow. Pop. (1918) 212,659.

VALTELLINE, the rich and fertile valley of the Upper Adda down to its influx into the Lake of Como. In a wider sense the term covers the whole of that part of Lombardy which includes this valley as well as Chiavenna and Bormio, corresponding to the modern province of Sondrio. The 120,000 inhabitants speak a dialect of Italian akin to the Romansch. In the 16th century the district became subject to the Swiss canton of Grisons; the latter, however, steadily resisted the efforts of the Valtellines to secure citizenship, which resulted in the bloody Valtelline war (1620). The Grisons was victorious, and governed the Valtelline more oppressively than ever, till at the petition of the inhabitants Napoleon incorporated the country with the Cisalpine republic, and the Valtelline has since shared the fortunes of Lombardy and Italy.

VALVE, a kind of movable lid or cover adapted to the orifice of some tube or passage, and so formed as to open communication in one direction and to close it in the other, used to regulate the admission or escape of a fluid, such as water, gas, or steam. Some valves are self-acting, that is, they are so contrived as to open in the required direction by the pressure of the fluid on their surface, and immediately to shut and prevent the return of the fluid when the direction of its pressure changes. Others are actuated by independent external agency. Examples of the former kind are presented in the valves of pumps, and in the safety valves of steam boilers, and of the latter in the slide-valves appended to the cylinder of a steam engine for the purpose of regulating the admission and escape of the steam. The construction of valves admits of an almost endless variety.

VAMBERY, ARMINIUS, or **HERMANN**, a Hungarian traveler and Orientalist; born in Szerdahely, Hungary, March 19, 1832. Escaping from the tailor's bench to which his family would have condemned him, he succeeded amid much privation and hardship in laying the foundations of wide linguistic scholarship, first under the Piarists of St. Georgen near Pressburg, and afterward at Vienna and Pest. He was a strong believer in the regenerative power of Western civilization and was almost as strongly a partisan of English as opposed to Russian influence. Besides the narrative of his great journey, which appeared in German, English, and Hungarian, in 1865, he published "German-Turkish Dictionary" (1858); "Abuschka: Turkish-Hungarian Dictionary (1861); "A Study of the Turkish Language" (1867); "Sketches in Central Asia" (1867); "Central Asian and Anglo-Russian Frontier Question" (Lond. 1874); "Ethics of the East" (Berl. 1876); "Etymological Dictionary of the Turco-Tartar Tongue" (Leip. 1877). He died in 1913.

VAMPIRE, the subject of one of the most gruesome superstitions in the world; that of the dead leaving their graves to destroy and prey on the living. It is characteristically Slavonic, though by no means exclusively so, and it is strongest of all in White Russia and the Ukraine. It still dominates the popular imagination in Russia, Poland, Servia, among the Czechs of Bohemia, and the Slovaks of Hungary, and also in a less degree in Albania and Greece. The modern term for a vampire is identified by Bernhard Schmidt with the Slavonic name of the werewolf (Bohemian, *vlkodlak;* in Bulgarian and Slovak, *vrkolak*), the regular name for a vampire in Servia being *vukodlak*. The Russian *vampir* (South Russian, *upuir*, anciently *upir;* Polish *upior*) in his earthly life was a wizard, a witch, a werewolf, a suicide, or one cursed by his parents or the Church. Even an innocent man may

involuntarily become a vampire by himself falling a victim to one, or merely by a cat or a bird accidentally crossing his corpse before its burial.

VAMPIRE BAT, a name formerly given to *Vampyrus spectrum*. Also any species of the group Desmodontes, consisting of two genera, each represented by a single species. They differ from all other bats in the character of dentition, the upper incisors being very large, trenchant, and occupying the whole space between the canines; premolars very narrow, with sharp-edged longitudinal crowns; molars rudimentary or none; œsophagus very narrow; cardiac extremity of stomach greatly elongated, forming a long, narrow cæcum. The species are sanguivorous, and cling by their extremities to the body of the animal whose blood they may be sucking.

VAN, a town of Armenia, on Lake Van; the capital once of an Armenian kingdom, near the S. E. shore of Lake Van; 145 miles S. E. of Erzerum; pop. about 30,000.—**VAN, LAKE**, a salt-water lake, 5,467 feet above sea-level; area about 1,600 square miles; it contains many islands and has no visible outlet.

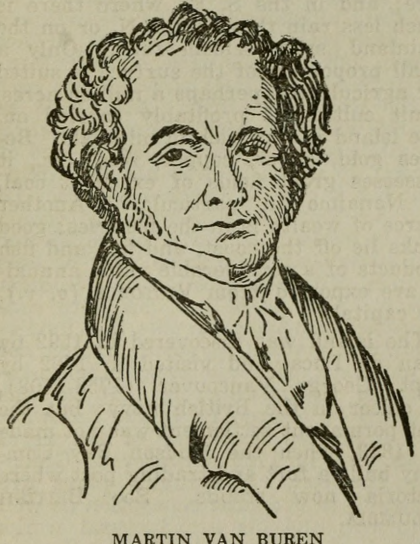
VANADIUM, in chemistry, a metallic pentad element, discovered by Sefstrom in 1830, in the refinery slag of the iron ores of Taberg, in Sweden; symbol, V; at. wt. 51.2. It is extracted from the finely pulverized slag by deflagrating with niter and sodic carbonate, digesting the fused mass with a saturated solution of sal-ammoniac, and igniting the product in an open vessel. On heating the mass with potassium, and washing with water, pure vanadium is obtained as a brilliant metallic powder, having a silver-white luster. It is non-volatile, does not tarnish in the air, burns vividly when heated in oxygen, is insoluble in hydrochloric acid, dissolves slowly in hydrofluoric acid, but very rapidly in nitric acid, forming a blue solution. It forms five oxides, analogous to the oxides of nitrogen, and three chlorides, viz., the dichloride, the trichloride, and the tetrachloride. The addition of metallic vanadium in very small quantities to chromium steel and other steels imparts to them a superior degree of tensile strength and elasticity.

VAN AMRINGE, JOHN HOWARD, an American educator; was graduated at Columbia College (now University) in 1860; was tutor of mathematics there in 1860-1863; adjunct professor of the same in 1864-1873; then was made full professor. In 1894 he was elected dean of the School of Arts. When Seth Low resigned the presidency of Columbia University on being nominated mayor of New York, Dr. Van Amringe was acting president of the university till the election, in January, 1902, of Dr. Nicholas Murray Butler. He is the author of a revised edition of Davies' "Legendre." He died in 1915.

VANBRUGH (van-brö'), **SIR JOHN**, an English architect and dramatist; born about 1666; educated partly in England and partly in France. He entered the army, became well known in London as a man of fashion, and then turned his attention to play-writing. His first play, "The Relapse," was brought out at Drury Lane about 1697, and was followed by "The Provoked Wife," and "Æsop." The first two of these had all the wit and most of the freedom of treatment which characterized that period, but "Æsop" was moral and dull, and therefore unsuccessful. How he obtained his knowledge of architecture is not known, but at this time (1702) Vanbrugh designed Castle Howard, the seat of the Earl of Carlisle. Afterward he entered with Congreve into a speculation to build a great theater at the W. end of London, in which he was his own architect; but it did not prove a success. In 1706 he was commissioned by Queen Anne to present the garter to the Elector of Hanover, and the same year he was occupied with the erection of Blenheim Palace. This work got him into considerable pecuniary trouble, as Parliament, which voted it, voted nothing for its payment. He built many other mansions for the nobility; in 1714 he was knighted by George I.; in the following year appointed controller of the royal works, and in 1716 surveyor of Greenwich Hospital. Vanbrugh's plays are admirable in dramatic conception as well as in wit, and his architectural works received the approval of Sir Joshua Reynolds. He died in London, March 26, 1726.

VAN BUREN, MARTIN, an American statesman; 8th President of the United States; born in Kinderhook, N. Y., Dec. 5, 1782. He became office boy to the village lawyer, studied hard, and was called to the bar in 1803. Long before this, however, he had developed a precocious interest in politics, and at the age of 18 was already member of a nominating convention. In 1812 and 1816 he was elected to the State Senate, and in 1815-1819 he was State attorney-general. In 1821 he entered the United States Senate, of which he was a member till his election in 1828 to the governorship of New York. In the same

year he zealously supported Jackson for the presidency, and in 1829 he was rewarded with the portfolio of Secretary of State. This he resigned in 1831. Two years later he was elected Vice-President, and in 1835 President, but by a popular majority of less than 25,000, and that largely owing to his declared opposition to the "slightest interference" with slavery. Van Buren's four years of office were darkened by the gloom of financial panic; but what one man could he did to lighten it, by wringing from Congress its assent to a measure for a treasury independent of private banks. This and his firm adherence to obligations of neutrality during the Canadian rebellion of 1837 are his most statesmanlike acts, but both cost him popularity and votes; in 1840 he and his party were overwhelmingly defeated by the Whigs. He lost the nomination in



MARTIN VAN BUREN

1844, because he opposed the annexation of Texas; and his nomination by the Free Soil party in 1848 only secured the return of the Whig candidate and the rejection of both Democrats. This was his last important appearance. Van Buren was a master of the politician's arts, but he used his great skill for what he counted the highest ends. He loved not to follow but rather to make public opinion and a party for himself; for he had on the whole a statesman's soul and not a place-hunter's. So we see him often doggedly ranging himself on the unpopular side—favoring negro suffrage, and opposing an elective judiciary. He was intensely partisan, trained a Jefferson Democrat, and loyal to his early teaching; yet his political antipathies did not destroy his warm private friendship for great opponents such as Henry Clay. He died in Kinderhook, July 24, 1862.

VANCE, ZEBULON BAIRD, an American lawyer; born in Buncombe co., N. C., May 13, 1830. He was educated at Washington College, Tenn., and at the University of North Carolina, and was admitted to the bar in 1852. He was member of Congress from North Carolina in 1858-1861; colonel in the Confederate army in the Civil War; governor of North Carolina in 1862-1865, and 1877-1879; and United States Senator from 1879 till his death in Washington, D. C., April 14, 1894.

VANCOUVER, a city and county-seat of Clarke co., Wash.; on the Columbia river; and on the Great Northern, the Union Pacific and other railroads; 6 miles N. of Portland, Ore. Here are St. James College (R. C.), the State School for Deaf and Dumb, and the State School for Blind, Fort Vancouver, the headquarters of the Military Department of Columbia, one of the best equipped military posts W. of the Mississippi, National and State banks, and several weekly newspapers. The city has manufactures of lumber, sashes and doors, bricks, artificial stone, ice, etc. Pop. (1910) 9,300; (1920) 12,637.

VANCOUVER, a city in British Columbia, Canada; on Burrard Inlet, at the W. terminus of the Canadian Pacific railway. It is the largest and most important city and seaport in British Columbia, with one of the finest harbors in the world. It has daily communication by mail steamers with Victoria. Vancouver is the home port of two lines of large and commodious ocean mail steamers, one plying to China and Japan and the other to Australia; and the headquarters of a fleet of smaller vessels engaged in the northern and coasting trade. It is well laid out with wide streets, lighted by electricity, the leading streets being paved, some with bituminous rock, others with sawed cedar blocks set on a concrete base. The climate is temperate and salubrious, with a more or less rainy season from November to March. Here are Episcopal, Roman Catholic, Presbyterian, Methodist, Baptist, and Congregational Churches; a normal school, high school in affiliation with McGill University, Montreal; and seven large and well-equipped public schools with accommodations for 3,800 pupils; Roman Catholic Hospital, City Hospital, St. Luke's Home; several orphanages; water works; street railroads; a well regulated fire depart-

ment; several banks; and three daily and several weekly newspapers. There are within the city limits, 23 parks, of over 1,400 acres, including Stanley Park of 1,000 acres. Shipbuilding is one of the important industries. During 1919 42 wooden steamers were launched, 5 schooners, and 10 steel steamers, with a tonnage of 165,000, with a value of $28,875,000. There are 80 miles of water frontage. The city has 85 schools and missions and a school enrollment of over 17,000 pupils, and over 400 teachers. The assessed value of real estate in 1919 was $224,202,883. The bank clearings in the same year amounted to $657,913,208. There are nearly 450 industries, employing nearly 30,000 wage earners. The value of the manufactured products in 1915 was $33,871,044. The city has large lumber interests, pork-packing plant, a sugar refinery, railroad construction and repair shops, ironworks, foundries, extensive warehouses, etc., and is the center of the Fraser river salmon industry. Vancouver was laid out in 1885. It was entirely destroyed by fire in 1866, but was rebuilt the same year and since then has had a marvelous growth. Pop. (1891) 13,685; (1901) 26,133; (1919) 109,250.

VANCOUVER, GEORGE, an English navigator; born about 1758. He entered the navy as midshipman in 1771; accompanied Cook on his second and third voyage (1772-1774 and 1776-1779); was made 1st lieutenant in 1780; and served in the West Indies till 1789. In 1790 he was put in command of a small squadron sent to take over Nootka from the Spaniards, and was also charged to ascertain if there was a N. W. passage. He sailed in the "Discovery," April 1, 1791, spent some time at the Cape, and afterward made for Australia and New Zealand, the coast of which he surveyed. He then went N. and received formal surrender of Nootka, and spent the three summers of 1792-1794 in surveying the coast as far N. as Cook's Inlet, wintering at the Sandwich Islands. On his return voyage he visited the chief Spanish settlements on the W. coast of South America, and reached England in 1795, where a narrative of his voyage was published in 1798. Vancouver Island was named after him. He died near London, May 10, 1798.

VANCOUVER ISLAND, an island belonging to British Columbia; in lat. 48° 19′-50°53′ N. and lon. 123° 17′-128° 28′ W.; is separated from the mainland by Queen Charlotte Sound, Johnstone Strait, and Strait of Georgia, which taken together form an open sea way. The island is 275 miles in length, and from 50 to 65 miles in breadth; area, about 12,000 square miles; pop. about 100,000. Its outline is boldly picturesque. The shores are marked by abrupt rocky cliffs and promontories, by pebbly beaches and sheltered coves, with fine harbors. The W. shores are gloomy and frowning in aspect, deeply indented by fiord-like arms of the sea, the banks of which are formed by steep rocks rising like walls. The whole country is more or less densely wooded, except where the mountain summits afford no foothold for plants, or where open grass lands occur. There are no navigable rivers, and the streams, which are torrents in winter, and are nearly dry in summer, are short, and are valuable only as supplying power for mills. The climate resembles that of southern Britain; the warm Pacific Gulf Stream striking the coast preserves a mild and equable temperature; and in the S. E., where there is much less rain than in the N. or on the mainland, snow seldom falls. Only a small proportion of the surface is suited for agriculture—perhaps a million acres. Fruit culture is profitably carried on. The island is very rich in minerals. Besides gold, silver, copper, iron, etc., it possesses great fields of excellent coal, at Nanaimo in particular. Another source of wealth is in the fisheries; good banks lie off the coast, and fish and fish products of a considerable value annually are exported from VICTORIA (*q. v.*), the capital.

The island was discovered in 1592 by Juan de Fuca, and visited in 1792 by Capt. George Vancouver (1758-1798), an officer in the British navy; but the first permanent settlement was not made till 1843, when the Hudson Bay Company built a fort and trading post where Victoria now stands. See BRITISH COLUMBIA.

VANDAL, one of the Slavonic or Teutonic tribes who inhabited the banks of the Oder, and the sea coasts of Pomerania and Mecklenburg, about A. D. 250. At the beginning of the 5th century they traversed the Rhine, the Rhône, and the Pyrenees, and founded a powerful kingdom in Spain. They afterward passed into Africa under their king, Genseric, 429, and after a career of conquest on that continent, during which they had embraced Christianity, Carthage fell under their victorious arms, Oct. 9, 439. Here they commenced the formation of a powerful navy, and fitted out an expedition against Rome, which they sacked June 15-29, 455. Having embraced the Arian heresy in 530, they carried on a cruel persecution against the members

of the orthodox faith. Their rule in Africa was destroyed by Belisarius, and the entire nation had disappeared from that continent 558. Hence, a person ignorant and barbarous, and hostile to the progress of the arts and literature.

VANDERBILT, CORNELIUS, an American capitalist; born near Stapleton, Staten Island, N. Y., May 27, 1794; early engaged in steamboat transportation between Staten Island and New York and so enlarged his business that he soon gained the complete control of the New York and Staten Island lines. Later he started steamboats in various waters—the Hudson, the Delaware, Long Island Sound, etc.; established steamboat and other connections between New York and California; and by 1864 was the owner or controller of nearly the whole water transportation in and about New York. In that year, however, he withdrew his capital from shipping and invested it in railroads. He secured the management of one railroad after another and in 1877 controlled stocks representing an aggregate capital of $150,000,000, of which he owned fully one-half. In 1861 he presented the swift $800,000 steamship "Vanderbilt" to the United States Government to be used for the capture of Confederate privateers and in 1873 founded the Vanderbilt University in Nashville, Tenn., with $500,000, afterward increased to $700,000. At the time of his death in New York City, Jan. 4, 1877, his fortune was estimated at nearly $100,000,000.

VANDERBILT, CORNELIUS, an American capitalist; born in New Dorp, Staten Island, N. Y., Nov. 27, 1843; a son of William Henry; was assistant treasurer of the Harlem railroad in 1865-1867; treasurer in 1867-1877; first vice-president of the New York Central railroad in 1877-1885; and chief director of the Vanderbilt system of railroads in 1885-1895, when he retired from business because of failing health. He united with his brothers in a gift of $250,000 for the erection of the Vanderbilt Clinic of the College of Physicians and Surgeons in 1896; presented an addition costing $250,000 to St. Bartholomew's Home in New York City; gave Rosa Bonheur's painting, "The Horse Fair," to the Metropolitan Museum of Art; and was the donor of $100,000 to the fund of the Protestant Episcopal Cathedral of St. John the Divine. "Vanderbilt Hall" to Yale University, and large sums of money to various charitable, religious, and public institutions. He died in New York City, Sept. 12, 1899.

VANDERBILT, CORNELIUS, III, an American soldier and capitalist; the son of Cornelius Vanderbilt. He graduated from Yale in 1895, and at once became a director in many important financial institutions. He was actively associated in the work of the National Guard in New York City, and at the entrance of the United States in the war with Germany he was appointed colonel of the 102d United States Engineers. In 1918, he was appointed brigadier-general in the National Army. He saw service in France, and at the conclusion of the war was appointed brigadier-general of the Officers' Reserve Corps.

VANDERBILT, WILLIAM HENRY, an American capitalist; born in New Brunswick, N. J., May 8, 1821; son of the first Cornelius; appointed vice-president of the Hudson River railroad in 1864 and later of the New York Central railroad; and on the death of his father became president of these railroads, together with the Lake Shore and the Michigan Central. Subsequently he secured control of the Chicago and Northwestern and of the Cleveland, Columbus, Cincinnati and Indianapolis railroads and also obtained connections with the New York, Chicago and St. Louis and West Shore railroads. He resigned his various offices, because of failing health, in 1883 and placed his affairs in charge of his son Cornelius. Among his public benefactions were the removal of the obelisk from Egypt to Central Park, New York City, and the gift of $200,000 to the Vanderbilt University fund. He died in New York City, Dec. 8, 1885.

VANDERBILT UNIVERSITY, an American educational institution in Nashville, Tenn., originally founded under the name of Central University in 1873 It was the outgrowth of a movement in the Methodist Episcopal Church, South, for higher education. When the first endeavor to secure the means for its establishment was unsuccessful, and the movement seemed to fail entirely, Cornelius Vanderbilt, of New York City, donated $500,000, in consideration of which the institution was named Vanderbilt University. Later Mr. Vanderbilt increased his gift to $1,000,000, and his son, William H. Vanderbilt, gave sums amounting in all to $450,000. The university has seven distinct departments, including the academic, medical, theological pharmaceutical, law, dental, and engineering. Reports at the close of 1919 showed: Professors and instructors, 145; students, 785; funds, $1,300,000; president, J. H. Kirkland, LL. D., Ph. D.

VANDERGRIFT, a borough of Pennsylvania, in Westmoreland co., about 40 miles east of Pittsburgh, on the Pennsylvania railroad. One of the largest sheet steel plants in the world is located here. Pop. (1910) 3,878; (1920) 9,531.

VANDERLIP, FRANK ARTHUR, an American banker and financier, born in Aurora, Ill., in 1864. He was reared in a pioneer environment, attended a country school only until fifteen, though later he studied at the University of Chicago. As a lad he worked in a machine shop, then became a newspaper reporter and, in 1890, financial editor of the Chicago "Tribune." In 1894, he became associate editor of the Chicago "Economist." Three years later Lyman Gage, then Secretary of the United States Treasury, made him his private secretary; but so conspicuous was his ability that President McKinley appointed him Assistant Treasurer of the United States. From this position he resigned in 1901 to become vice-president of the National City Bank of New York, of which institution he was president 1909-1919. He was a director in many corporation and a trustee of the Carnegie Foundation, New York University, Massachusetts Institute of Technology, etc. During the participation of the United States in the World War he was chairman of the War Savings' Commission and personally conducted the sale of the War Savings' Certificates. He traveled extensively in Europe and the Far East since the war and was considered one of the greatest experts on world finance. He was the author of "The American Commercial Invasion of Europe" (1907); "Business and Education" (1907); and "Business and Politics" (1915); "Political Problems of Europe" (1920), besides many articles in financial and economic publications.

VANDERVELDE, WILLEM, called THE ELDER a Dutch painter; born in Leyden, in 1610; excelled in marine subjects. In the great naval fight between the Duke of York and the Dutch admiral Opdam, Vandervelde sailed between the hostile fleets in a light skiff to mark their positions and observe their operations; and in this manner he is said to have also been a spectator of the memorable three days' engagement between Monk and De Ruyter. He died in 1693. His son, WILLIAM VANDERVELDE, called THE YOUNGER, born in 1633, was himself an admirable marine painter. He died in London, in 1707.

VAN DEVANTER, WILLIS, an American jurist, born in Marion, Ind., in 1859. He graduated from DePauw University and from the Cincinnati Law School. For several years he practiced law in Marion, Ind., and then removed to Cheyenne, Wyo. He acted as city attorney for that city and as a member of the Territorial Legislature. In 1889-90 he was chief justice of the Supreme Court of Wyoming, and from 1897 to 1903 was assistant attorney general of the United States. He was appointed United States circuit judge in 1903, serving until 1910, when he was appointed associate justice of the Supreme Court of the United States.

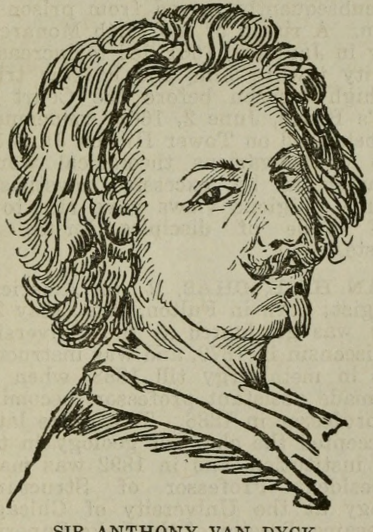
VAN DIEMEN'S LAND. See TASMANIA.

VAN DORN, EARL, an American military officer; born near Port Gibson, Miss., Sept. 17, 1820; was graduated at the United States Military Academy in 1842; became a captain in 1855, and resigned his commission on the outbreak of the Civil War in 1861; joined the Confederate army; took an active part in the battle of Pea Ridge, March 7 and 8, 1862; attacked General Rosecrans at Corinth, Oct. 3-4, 1862, and was defeated with great loss. He was killed in a private quarrel in Maury co., Tenn., May 8, 1863.

VAN DYCK, SIR ANTHONY, a Flemish portrait and historical painter; born in Antwerp, Belgium, March 22, 1599. He was the seventh child of Frans Van Dyck, a silk and woolen manufacturer, and his second wife, Maria Cuypers, a lady celebrated for her skill in embroidery. In 1609 he entered the studio of Hendrik Van Balen, a capable painter of the place; in his 15th year he began to study under Rubens, and in 1618 he was admitted a master of the Antwerp Guild of St. Luke. He soon came to be recognized as the most promising of the pupils of Rubens. In the contract, dated 1620, for the decoration of the Jesuit Church of Antwerp it was stipulated that he was to assist his master in the production of 39 pictures; and the "Christ Bearing the Cross," in the church of the Dominicans, may be referred to as a work of this period. In 1620 Van Dyck made a brief visit to England, when he appears to have executed the full-length of James I. at Windsor. In 1623, by the advice of Rubens, he started to study in Italy; and, on his way, he is said to have fallen in love with a beautiful country girl of the little village of Saventhem, near Brussels, and to have delayed there, painting his famous "St. Martin Dividing His Cloak," still in the parish church, and a "Holy Family," since lost.

Arriving in Venice, he devoted himself

to an enthusiastic study of the masterpieces of Titian, Giorgione and Veronese; and, passing to Genoa, he executed there a series of noble portraits, strongly impressed with the influence of Italian art, many of which are still preserved in the palaces of the families for whom they were painted. In Rome he resided for nearly two years, producing a "Crucifixion" for Cardinal Bentivoglio, and for the Pope an "Ascension" and an "Adoration of the Magi." After visiting Turin and Sicily, he again worked in Genoa, and by 1628 he had returned to his native city, where he painted his great "Ecstasy of St. Augustine" for the chapel of the Augustine monastery, various subjects for the Célibataires, and the splendid "Christ Crucified Between Two Thieves" for the church of the Récollets at Mechlin, now in the cathedral there. It was about this period that he executed the fine series of grisaille portraits of eminent contemporaries which were published as engravings by Martin Vanden Enden, and with additions in 1641 by Giles Hendrix of Antwerp. In some 20 of these plates the painter himself etched the heads, and in their early states, before the line work of the engravers has been added, these prints are greatly valued. The astonishing spirit, vigor, and expressiveness of the lines by means of which the features are rendered entitle Van Dyck to rank as one of the master etchers of the world.



SIR ANTHONY VAN DYCK

In 1629 the painter again visited England, but he received little encouragement, and soon returned. We next find him at The Hague, painting the Prince of Orange and his family, Christian, Duke of Brunswick, and Count Ernest of Mansfield; and in the spring of 1632 he again came to London, under the patronage of the Earl of Arundel, and was warmly received by Charles I., who had been impressed by his portrait of Lanière the musician, and had purchased his "Armida and Rinaldo." He was knighted by the king, appointed his principal painter in ordinary, installed at Blackfriars, and assigned a country residence in Eltham Palace; and in 1633 a pension of $1,000 was bestowed on him, which, however, was very irregularly paid. One of his earliest works during his residence in England was the group of the king, queen, and two of their children, at Windsor; and during the next eight years he painted nearly every distinguished person connected with the court. About 1639 he married, through the influence of the king, Maria Ruthven, granddaughter of the first Earl of Gowrie. Leading a careless life and lavish in his pleasure, Van Dyck suffered from pecuniary straits; and frequently he found difficulty in obtaining payment for the royal commissions. The greater part of 1634 and 1635 was spent in the Netherlands, when he painted Ferdinand of Austria, brother of Philip IV., now at Madrid, and many other portraits, and such religious subjects as "The Adoration of the Shepherds," in the church at Termonde, and "The Deposition," now in the Antwerp Museum; and at this time he was elected honorary president of the Antwerp Guild of St. Luke. In 1640 he visited his native city for the last time and then passed to Paris, hoping to be employed by Louis XIII. on the decoration of the Louvre; but here again he was unsuccessful, though he received other commissions. On his return to England he found that political troubles were distracting the country. His own health was now permanently broken, and he died in his house at Blackfriars, Dec. 9, 1641, and was buried in Old St. Paul's.

VAN DYKE, HENRY, an American educator; born in Germantown, Pennsylvania, Nov. 10, 1852; was graduated at Princeton University in 1873, at the Princeton Theological Seminary in 1877, and at Berlin University in 1878; and soon afterward assumed the pastorate of the United Congregational Church in Newport, R. I. He was chosen pastor of the Brick Presbyterian Church, in New York City in 1883, and continued in that charge till 1900, when he resigned to become Professor of English Literature in Princeton University. He was appointed minister to the Netherlands in 1913,

serving until 1918. President of the National Institute of Arts and Letters, 1909-10. His publications include: "The Reality of Religion"; "The Poetry of Tennyson"; "The Christ-Child in Art"; "The Builders, and Other Poems";



HENRY VAN DYKE

"Fisherman's Luck"; "The Friendly Year"; "Preface to Counsel on Books and Reading"; "The Ruling Passion"; "Grand Canyon, and Other Poems," etc.

VAN DYKE, JOHN CHARLES, an American art critic; born in New Brunswick, N. J., April 21, 1856; was educated at Columbia and Rutgers Colleges; admitted to the bar in 1877; studied art in Europe, and on his return to the United States devoted himself to literary work and to lecturing on art in Rutgers, Harvard, Princeton, and other universities. He was the editor of the "Studio" in 1883-1884, the "Art Review" in 1887-1888, and the author of "Books and How to Use Them"; "Principles of Art"; "How to Judge a Picture"; "Art for Art's Sake"; "Modern French Masters"; "Nature for Its Own Sake"; "New Guides to Old Masters"; etc.

VANE, SIR HENRY, commonly called SIR HARRY VANE, an English statesman and writer; born in Hadlow, Kent, England, in 1612; eldest son of Sir Henry Vane, secretary of state. He was educated at Westminster and Oxford, afterward completing his education at Geneva, where he became a Puritan and a republican. Returning to England, he found that his religious and political opinions exposed him to much ill will and annoyance, and he consequently emigrated to New England, arriving at Boston in 1635. He was elected governor of Massachusetts in 1636. In 1637 he returned to England, after which he was knighted, entered Parliament, and became treasurer of the navy. He took part in the impeachment of Strafford, and was a zealous supporter of Parliament in the civil war and one of the leaders in the Long Parliament. He was also a supporter of the Solemn League and Covenant. He was averse to the execution of the king, and came into conflict with Cromwell in consequence of the forcible dissolution of the Long Parliament (1653). In 1656 he was imprisoned in Carisbrooke Castle for four months, by order of Cromwell, on account of a pamphlet he had written. On his release he continued to resolutely oppose the government of Cromwell and of his son Richard. In 1659 he was a member of the committee of safety and president of the council of state. After the Restoration he was sent to the Tower in February, 1660, and subsequently moved from prison to prison. A rising of the Fifth Monarchy party in January, 1661, led to increased severity toward him, and he was tried for high treason before the Court of King's Bench, June 2, 1662, condemned, and beheaded on Tower Hill on June 14.

He wrote various theological works characterized by excessive mysticism, and his religious views gave rise to a small circle of disciples known as Vanists.

VAN HISE, CHAS. R., an American geologist; born in Fulton, Wis., May 29, 1857; was graduated at the University of Wisconsin in 1879, and was instructor there in metallurgy till 1883, when he was made assistant professor, becoming full professor in 1886. Two years later he accepted the chair of geology in the same institution, and in 1892 was made non-resident Professor of Structural Geology at the University of Chicago. He became director of the Lake Superior division of the United States Geological Survey. He was elected president of the University of Wisconsin in 1903, serving until 1918. He was the joint author of the memoirs "On Secondary Enlargements of Mineral Fragments in Certain Rocks" (1884); "The Penokee-Gogebic Iron-bearing Series of Michigan and Wisconsin" (1892); "Correlation Papers, Archean and Algonkian" (1892); "Principles of North American Pre-Cambrian Geology" (1896); "Concentration and Control" (1912). He died Nov. 19, 1918.

VAN HORNE, SIR WILLIAM CORNELIUS, a Canadian railroad official; born in Joliet, Ill., Feb. 3, 1843; began his career as an office boy in a railroad

station; was rapidly promoted till he was made general superintendent of the St. Louis, Kansas City and Northern railway in 1872. Later he successively held the same post on the Southern Minnesota, the Chicago and Alton, and the Chicago, Milwaukee and St. Paul railroads. In 1880 he was made general manager, and in 1888, president of the Canadian Pacific railway. He was created an honorary K. C. M. G. by Queen Victoria in May, 1894, in recognition of his eminent public services. He died in 1915.

VANILLA, a genus of epiphytal *Orchideæ*, natives of tropical America and Asia. They are distinguished from most other orchids by their climbing habit; they cling with their aërial roots to the stems of trees or to rocks, attain the height of 20 or 30 feet, and obtain their chief sustenance from the atmosphere. There are about 20 species comprised in the genus. The flowers are thick, fleshy, and fragrant, but dull in color. Vanilla is remarkable among orchids as possessing the only species of the order that has any economical value. From the fruit of several species the vanilla of commerce is obtained, the best being produced by the West Indian species, *V. planifolia*, which is now cultivated in many tropical countries. The fruit is cylindrical, about a span long, and less than half an inch thick. It is gathered before it is fully ripe, dried in the shade, and steeped in a fixed oil, generally that of the cashew nut. It contains within its tough pericarp a soft black pulp, in which many minute black seeds are imbedded. It has a strong, peculiar, agreeable odor, and a warm, sweetish taste. Benzoic acid is sometimes so abundant in it as to effloresce in fine needles. Vanilla is much used by perfumers, and also for flavoring chocolate, pastry, sweetmeats, ices, and liquors. Balsam of Peru is sometimes used as a substitute for it. When the fruit of vanilla is fully ripe a liquid exudes from it. Vanilla has ripened its fruit in British hothouses, but the flowers are apt to fall off without fruit being produced, unless care is taken to secure it by artificial impregnation. This is, in some measure, the case even in India and in some parts of America itself.

VANLOO, JEAN BAPTISTE (von-lō′), a member of a family originally Flemish, in which a love of art seemed indigenous; born in Aix in Provence, in 1684. He painted successively at Nice, Toulon, and Aix, visited Genoa and Turin, and was sent by the Prince of Carignano, son-in-law of the Duke of Savoy, to study at Rome under Benedetto Luti. After a further residence at Turin, he proceeded in 1719 to Paris, and speedily acquired a great reputation as a portrait painter. He was made a member of the Academy in 1731, and Professor of Painting in 1735; and visited London, where he painted Colly Cibber and Sir Robert Walpole. He died in Aix, Dec. 19, 1745. CHARLES ANDRÉ VANLOO, his younger brother, was born in Nice, Feb. 15, 1705. He also studied at Rome under Benedetto Luti, and then settled in Paris, but later returned to Rome. At Turin he painted for the King of Sardinia a series of subjects illustrative of Tasso, after which he returned to Paris, and was appointed in 1735 a member of the Academy, and later a knight of the order of St. Michael, and chief painter to the king. He died in Paris, July 15, 1765.

VANNES (vän), a seaport town of France; capital of the department of Morbihan in Brittany; at the mouth of a tributary of the Gulf of Morbihan; 3 miles from the sea. The cathedral (13th to 15th centuries) is the most important edifice; but the town possesses also an old House of Parliament and many carved houses, and a rich museum of Celtic antiquities. Manufactures of woolens and ropes and some shipbuilding are carried on; and the small port has some trade. Pop. about 20,000.

VAN RENSSELAER, HENRY KILIAN, an American patriot of Dutch descent; born in Albany, N. Y., in 1744; commanded a regiment in the Revolutionary War; distinguished himself on several occasions; and in October, 1777, aided in the actions which led to the surrender of Burgoyne. After the peace a famous mutiny broke out among his troops. He died in Greenbush, N. Y., Sept. 9, 1816.

VAN RENSSELAER, MRS. MARIANA (Griswold), an American art critic; born in New York City, Feb. 23, 1851. She contributed largely to current periodicals on art and architecture, and published the valuable books: "Art Out of Doors"; "English Cathedrals"; "American Etchers" (1886); "Henry Hobson Richardson and His Works" (1888); and "One Man Who Was Content, and Other Stories." She died in 1914.

VAN RENSSELAER, STEPHEN, an American military officer; born in New York, Nov. 1, 1764; was graduated at Harvard College in 1782; elected to the New York Assembly as a Federalist in 1789; was a State Senator in 1791-1796;

lieutenant-governor in 1795; and a member of the State Assembly in 1798 and 1808-1810. He became major of militia in 1786, was promoted colonel in 1788, and major-general in 1801; and in 1812 was assigned to the command of the Northern frontier, in which capacity he commanded at the battle of Queenstown Heights, Oct. 13-14, 1812. On Oct. 24, he resigned his commission because of public dissatisfaction with his conduct in that engagement. He was chosen chairman of the Erie Canal Commission; became a regent of the University of New York; made a geological survey along the line of the Albany and Buffalo canal in 1821-1823; founded the Rensselaer Polytechnic Institute at Troy, N. Y.; and was a member of the State Constitutional Convention in 1821, and of Congress in 1823-1829. He died in Albany, N. Y., Jan. 26, 1839.

VAN SCHAACK, PETER, an American jurist; born in Kinderhook, N. Y., in March, 1747; was graduated at Columbia College in 1768. In 1773 he was appointed a commissioner to revise the colonial statutes. During the Revolutionary War he sympathized with the British. In June, 1777, he was called before the Committee on Conspiracies and asked to take the oath of allegiance to the Continental Congress. Declining to do so, he was sent to Boston, where he was kept under constant surveillance, and in October, 1778, was exiled from the country. He returned to the United States in 1785, and soon became eminent in his profession. The degree of LL. D. was conferred on him by Columbia College in 1778. His publications include: "Laws of the Colony of New York" (2 vols. 1773); and "Conductor Generalis, or the Duty and Authority of Justices, Sheriffs, Constables, etc. Revised and Adapted to the United States." He died in Kinderhook, N. Y., Sept. 17, 1832.

VAN WERT, a city and county-seat of Van Wert co., O.; on the Pennsylvania and the Cincinnati Northern railroads; 27 miles W. N. W. of Lima. It contains a number of churches, a court house, National and other banks, and several newspapers. It has planing mills, and manufactures of stoves, wagons, etc. Pop. (1910) 7,157; (1920) 8,100.

VAPEREAU, LOUIS GUSTAVE (väp-rō'), a French compiler; born in Orleans, France, April 4, 1819. He was Professor of Philosophy at the College of Tours for 10 years; admitted to the bar in 1854, and about the same time made editor of the famous "Universal Dictionary of Contemporaries" (1858; 6th ed. 1891-1893). Among his other important works are: "Literary and Dramatic Year" (11 vols. 1859-1869); "Universal Dictionary of Literatures" (1876); "Historical Elements of French Literature" (2 vols. 1883-1885). He was Inspector-General of Public Instruction in 1877, and received the Cross of the Legion of Honor in 1878. Died in 1906.

VAPOR, in physics, an aëriform fluid into which some volatile substance is changed by the action of heat. Vapor is essentially the same as gas, but the word vapor is conventionally limited to the gaseous state of a body which is liquid or solid at ordinary temperatures, while the term gas is applied to aëriform bodies which are in that rarefied state at ordinary temperatures. Thus we speak of hydrogen gas, but of watery vapors. Vapors, like gases, have a certain elastic force, by which they exert a pressure on every part of any vessel in which they are inclosed. Vapors are formed instantly in a vacuum; in the atmosphere they are generated more slowly. When not saturated they exactly resemble gases in their action; when saturated and in contact with the liquid by which they were generated, they can neither be compressed nor expanded, but remain constant, both in their elastic force and in their density. Vapors of different composition vary in density. Thus if atmospheric air be taken as unity, the vapor of water=0.6235, that of alcohol 1.6138, that of sulphur 6.6542, and that of mercury 6.9760.

VAR, a department in the extreme S. E. of France; area, 2,349 square miles; pop. about 340,000. The department receives its name from the Var river, which formerly served as its boundary on the E., but which, since the arrondissement of Grasse was taken from Var and added to the Alpes Maritimes, now belongs entirely to the latter. Var is well watered by a great number of streams, of which the chief are the Gapau, Argens, and Bianson. In the N. and N. E. it is mountainous, being traversed by a branch of the Alpes de Provence, called the Monts de l'Esterel. Between the mountains and the water courses are many very fertile valleys. The climate, tempered by the altitude of the surface, is pleasant. Fruits of all kinds are here cultivated with remarkable success; tobacco is grown, and much wine is produced. The department abounds in minerals, and carries on an active commerce. It is divided into the three arrondissements of Draguignan, Brignoles, and Toulon. Capital Draguignan.

VARANGIANS, or **VARAGIANS**, the name applied to the Norse vikings, who at the close of the 9th century, founded various principalities in Russia. Some of them afterward entered the service of the Byzantine emperors, and became the imperial guards at Constantinople. Here they were recruited by Anglo-Saxons and Danes, who fled from England to escape the Norman yoke.

VARDAMAN, JAMES KIMBLE, an American public official, born in Jackson co., Texas, in 1861. He was educated in the public schools of Mississippi and was admitted to the Mississippi bar in 1882. In 1883 he was editor of the Winona (Miss.) "Advance," from 1890 to 1896 editor of the Greenwood (Miss.) "Enterprise," and in the latter year established the Greenwood "Commonwealth." He became in 1908 editor of "The Issue," Jackson, Miss. He was a presidential elector in 1892 and 1896, a member of the Mississippi House of Representatives from 1890 to 1896, captain and later major of the 5th United States Volunteer Infantry from 1898 to 1899, Governor of Mississippi from 1904 to 1908, and Democratic United States Senator from 1913 to 1919. He was defeated for re-election in 1918.

VARIATION, in astronomy, any deviation from the mean orbit or mean motion of a heavenly body produced by the perturbation of another body or bodies. Thus the planets are considered to move mathematically in elliptic orbits, which would be the case if they were subject to the attraction of the sun only, but being acted on by each other, there is supposed to be a minute and slow but constant variation in the elements of the ellipse. Variations which are compensated in short intervals are called periodic, and those which require for their compensation a long period are called secular.

In biology: (1) A tendency in all organisms to vary slightly from other organisms produced by the same parents. (2) Hereditary modification. (3) A modification directly due to the physical conditions of life; such as the dwarfed condition of shells in the Baltic, or of stunted plants on Alpine summits. (4) An organism, or a group of organisms, exhibiting modification due to external conditions.

VARICK, THEODORE ROMEYN, an American surgeon; born in Dutchess co., N. Y., June 24, 1825; was graduated at the Medical Department of the New York University in 1846. He settled in Jersey City, N. J., in 1848; and became famous as a surgeon. He introduced the use of cocaine in capital amputations, and was the first in the United States to employ the method of Trendelenberg in performing amputations at the hip joint. He also perfected a method for the use of hot water in surgery, by which he performed the largest number of successful operations known to his time, failing in only three cases out of 54. He originated, too, the use of hot water in checking the ooze in laparotomy. His publications include "Urticaria Produced by Hydrocyanic Acid"; "Complete Luxation of the Radius and Ulna to the Radical Side"; "Distal Compression in Inguinal Aneurism"; "The Use of Hot Water in Surgery"; "Protective Treatment of Open Wounds"; etc. He died in Jersey City, N. J., Nov. 23, 1887.

VARICOSE VEINS. When a vein becomes dilated at a certain part of its course, for no apparent physiological object, such as relieving the venous circulation elsewhere (as, for example, in the case of the superficial abdominal veins enlarging in order to relieve a compressed vena cava), it is said to be varicose, the actual dilatation being called a *varix* (a word used in this sense by Cicero and Celsus). Some veins seem to be unaffected by varices, which, however, are of common occurrence in the sub-mucous veins of the rectum (constituting hemorrhoids or often piles), in the spermatic veins, giving rise to varicocele, and in the veins of the lower extremities. They are occasionally (but very rarely) found in other veins. Certain conditions of the system favor the formation of varices, among which may be noticed an indolent temperament, and a debilitated condition of the general system, accompanied by a relaxed state of the walls of the veins; and possibly also a congenital predisposition or hereditary tendency. Persons with such a disposition are more likely to suffer from this affection if their occupation is one which involves much standing or walking; and cooks, washerwomen, and foot-soldiers have been selected as specially prone to varicose veins. Varices may occur at almost any period of life, but are chiefly developed during middle age. Their formation is aided by any condition of the system which impedes the circulation, as certain diseases of the heart, lungs, and liver, and by continued high living, which is especially liable to induce hemorrhoids. Direct pressure on the veins, *e. g.*, by the use of garters, or by habitual constipation, is often an important factor in their production. From the researches of Andral, it appears that in varicose veins the coats of

the dilated vessels may become thickened or may become thin; that they be lengthened so that the veins become tortuous; and that the dilation may be unequal, giving rise to the formation of pouches; and that, in consequence of the enlarged caliber of the vessels, the valves only act imperfectly, and gradually undergo degeneration.

VARNA, a fortified town of Bulgaria (of which it is the chief port), on the Black Sea, and the capital of a district of the same name (area, 2,554 square miles; pop. about 350,000). It has a good harbor, and a large trade in grain. It is the see of a Greek archbishop. It was taken by the Russians in 1828, but restored to Turkey a year later by the peace of Adrianople. The Crimean expedition sailed from Varna in 1854. It was bombarded by the Russian fleet in 1915. Pop. about 45,000.

VARNHAGEN, FRANCISCO ADOLPHO DE, VISCOUNT OF PORTO SEGURO (värn-ä'gen), a Brazilian diplomatist and historian; born in São João de Ypanema, São Paulo, Feb. 17, 1816. His youth was passed in Portugal; on his return to Brazil in 1841, he was appointed to diplomatic posts in Lisbon, Paraguay, Peru, Vienna, and other places. He was indisputably the first of Brazilian historians, his works being distinguished by profound research and lucid style. Chief among them are: "General History of Brazil" (2 vols. 1854-1857); "History of the Struggles with the Dutch in Brazil" (2d ed. 1874); "Anthology of Brazilian Poetry" (1850-1853); biographical studies; monographs on Amerigo Vespucci; etc. He died in Vienna, Austria, June 29, 1878.

VARNHAGEN VON ENSE, KARL AUGUST (värn-hä'gen fon en'se), a distinguished Prussian diplomatist, regarded as one of the best of German prose writers; born in Düsseldorf, Feb. 21, 1785. In 1814 he married Rahel Levin, an accomplished Jewess, and became conspicuous in Berlin society. His numerous works consist mainly of biographical studies—including two memorials of his wife, who died in 1833—tales, criticisms, and poems. Of his "Diaries" several volumes have appeared. He died in Berlin, Oct. 10, 1858.

VARNHAGEN VON ENSE, MADAME (RACHEL ANTONIE FRIEDERIKE LEVIN), the wife of Karl August Varnhagen von Ense, a woman of great intellectual abilities and wide intellectual sympathies, who might almost be called the foster mother of German genius, a Jewess by birth, sister of the poet Ludwig Levin (afterward Robert-Tarnow); born in Berlin, Prussia, May 19, 1771. The first half of her life was spent in various towns of Germany, in Paris, and in Prague. Her first love having been killed in battle against Napoleon's army, Rahel became a Christian and married (in 1814) Varnhagen von Ense. Her house in Berlin was a gathering place for men of genius—philosophers, poets, artists, and writers. Her husband published a collection of her writings and letters as "Rahel" (1833), and three years later another collection; still later her correspondence with Veit (1861) and with Varnhagen (1875). She died in Berlin, March 7, 1833.

VARNISH, a thin, resinous fluid, which, when spread over the surface of wood, metal, glass, or other solid substances forms a shining coating, impervious to air and moisture. The great number of varnishes consist of some resinous material, dissolved in linseed oil, alcohol, or some liquid hydrocarbon such as turpentine and benzole. Those made by dissolving a resin in a non-volatile drying oil, like that from linseed, are called oil varnishes; and those prepared by using volatile solvents (alcohol, benzole, etc.) for the resins are called spirit varnishes. In the case of the latter the solvent becomes dissipated as the varnish dries, so that when any surface is coated with a varnish of this kind only a film or coating of resin remains, which is apt to crack and peel off; but means are taken either in the preparation of the varnish or in the laying of it on to counteract this tendency. With an oil varnish, on the contrary, the oil remains as part of the coating, giving it toughness, while the resin gives it hardness.

VARNISH TREE, the name given to various trees which furnish varnish. They are chiefly natives of the hotter parts of the Eastern Hemisphere and the varnish tree of each country or large province is, as a rule, different from that of others. In Tenasserim, Pegu, etc., the varnish tree is *Melanorrhœa usitatissima*, sometimes specifically called the Black, or Martabam varnish; that of Japan is *Rhus vernicifera* and *Stagmaria verniciflua;* that of Sylhet, *Semecarpus anacardium.* The varnish tree of the countries bordering on the Mediterranean is *Rhus coriaria.* It is a tree the leaves of which are divided into five to seven pairs of hairy leaflets with a terminal one. It is 15 to 20 feet high.

VARRO, CAIUS TERENTIUS, the Roman commander who was defeated at Cannæ by Hannibal in 216 B. C.

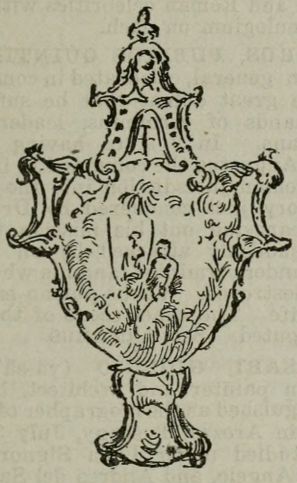
VARRO, MARCUS TERENTIUS, a Roman author; born probably of equestrian rank in the Sabine town of Reate, in 116 B. C. He studied under L. Ælius Stilo, and at Athens under Antiochus of Ascalon, whose philosophy Cicero makes him expound as an interlocutor in the "Posterior Academics." He saw some service under Pompey, and in the civil war was legate in Spain with Petreius and Afranius. He awaited the result of Pharsalia with Cicero and Cato at Dyrrachium, and was kindly treated by the conqueror, who appointed him to be librarian for his intended collection. The second triumvirate plunged him into danger, and Antony plundered his splendid Cacine villa, burned his beloved books, and placed his name in the list of the proscribed. But he was soon exempted, and Augustus even restored his property, so that he was able to spend his latest years in peace. He survived till 27 B. C. Varro was a man of upright and honorable character, a monument of the old-fashioned Roman virtues, even to their hard and unsympathetic side. His diction shows qualities of the same kind—it is pithy and vigorous, but harsh, abrupt, without flexibility or charm. The total number of his works amounted to about 620 books, belonging to 74 different works. Of the poetical works (satires, pseudo-tragedies and poems) nothing is known but the names. But of the 150 books of the "Satires of Menippus," a medley of prose and verse, imitated from the Cynic satirist Menippus enough fragments (ed. Riese, 1865; Bücheler, 1882) remain to prove the greatness of the loss. Here are in singular medley grotesque personifications of ideas, ridicule of the philosophers, mythology, erudition, proverbs, bitter satire at the social corruptions of the day, and praise of the homely virtues of the good old times, the whole spirited and rich in humor, if seldom artistic in form. Varro's prose writings embraced oratory, history both general and literary, jurisprudence, grammar, philosophy, geography, and husbandry. The most important of these were his "Human and Divine Antiquities," a work of vast learning in 41 books, a mine in which burrowed Pliny, Plutarch, Gellius, Festus, Macrobius, as well as the Christian fathers, especially St. Augustine; "The Latin Language," in 25 books, of which only v.-x. are extant (ed. C. O. Müller, 1833; L. Spengel, re-edited by his son, 1885), on the formation and inflection of words, and on syntax, married by arbitrary arrangement, and etymologies due to mere empirical word play; "Rustic Affairs, Part III.," almost entire (ed. Keil, Leip. 1884), in dialogue form, on agriculture, cattle, bird and fish breeding. His "Discipline, Part IX.," deserved to live, being an attempt at an encyclopædia of the liberal arts; his "Imagination, Part XV.," or "Hebdomades," was a series of 700 illustrated biographies of Greek and Roman celebrities with a metrical eulogium on each.

VARUS, PUBLIUS QUINTILIUS, a Roman general, celebrated in consequence of the great defeat that he suffered at the hands of Arminius, leader of the Germans. In 7 B. C., having received from Augustus the command to introduce the Roman jurisdiction into the German territory just conquered by Drusus, he was carrying out his mission when he was suddenly attacked by an immense host under Arminius, and his whole army was destroyed. Varus put an end to his own life. The exact scene of this battle is disputed. See ARMINIUS.

VASARI, GIORGIO (vä-sä'rē), an Italian painter and architect, but most distinguished as the biographer of artists; born in Arezzo, Tuscany, July 30, 1512. He studied under Luca Signorelli, Michael Angelo, and Andrea del Sarto. As an architect he showed great ability, as exemplified in his designs of the Palazzo degli Uffizi at Florence, and the church of Abbadia at Arezzo. As a painter he was less successful. His principal paintings are a "Lord's Supper," in the cathedral of Arezzo, several works in the Palazzo Vecchio in Florence, and in the Vatican in Rome. His "Lives of the Most Excellent Painters, Sculptors, and Architects" is of great interest, but it exhibits many errors respecting the earlier masters; and it is also guilty of partiality toward the Tuscan artists. It was first printed in 1550, and an enlarged and improved edition appeared in 1568. It has been translated into English. Vasari died in Florence, June 27, 1574.

VASCULAR SYSTEM, that portion of the interior of a plant in which spiral vessels or their modifications exist. In an exogenous stem, the vascular system is confined to the space between the pith and the bark. It chiefly consists of ducts and pitted or woody tissue collected into compact, wedge-shaped, vertical plates, the edges of which rest on the pith and the bark, while the sides are in contact with the medullary rays. It comprises the medullary sheath, which consists of spiral vessels and woody tissue intermixed. In an endogenous stem, the vascular system exists in the form of fibrous bundles, consisting of woody tissue containing spiral or other vessels, the whole imbedded in the cellular system.

In comparative anatomy, the circulatory system. A term applied to the whole series of vessels—arteries, veins, lymphatics, and lacteals—directly or indirectly connected with the circulation



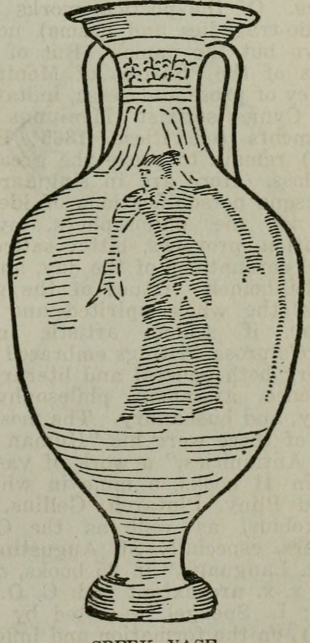
CHELSEA VASE

of the blood. The vessels of which it is composed are of two leading types—those which carry blood, and those carrying lymph or chyle. The first constitute the sanguiferous system, and include the heart, the arteries, the capillaries, and the veins. The second or absorbent system includes the smaller and larger lymphatic and lacteal vessels, with the lymphatic and mesenteric glands.

VASE, a vessel of various forms and materials applied to the purpose of domestic life, sacrificial uses, etc. They were often used merely for ornament, or were at least primarily ornamental in character and design. The antique vases found in great numbers in ancient tombs and catacombs in Etruria, southern Italy, Greece, Sicily, etc., and used to contain the ashes of the dead, were for the most part made of baked clay, painted and glazed, though by the Egyptians, Greeks and Ottomans other materials, such as precious stones, gold, silver, bronze, ivory, and glass were used. One form of vase seems to have been peculiar in Etruria—viz., black or red vessels, with figures in relief upon them. A favorite kind of vase, introduced into Rome by Pompey, was called Murrhine. Another kind was the cameo vase, made of two layers of glass, the outer of which was opaque, and was cut down so as to leave figures standing out upon the lower layer as a ground. To this class belongs the celebrated Portland Vase in the British Museum. The glass vases of Venice became famous in the beginning of the 16th century, and in the same and following centuries many vases of the highest artistic performance were produced in Italy, France, and Germany. The porcelain vases of China and Japan are also characterized by great elegance of form and beauty of ornamentation.

VASELINE, or **VASELENE**, petroleum jelly, a pale yellow, translucent, semi-solid substance, consisting of a mixture of the hydro-carbons $C_{16}H_{34}$ and $C_{20}H_{42}$, obtained by treating the undistilled portion of petroleum with superheated steam, and filtering while hot through animal charcoal.

VASSAR COLLEGE, an American institution of learning, established by Matthew Vassar in Poughkeepsie, N. Y., in 1861, for the higher education of women. The first donation was $428,000 for buildings and furnishings. This amount was increased by a bequest of $360,000. Later Matthew Vassar, Jr., gave the institution $130,000 and John Guy Vassar, $444,000. There have since been large donations from other persons. The campus, which contains 210 acres, is 3 miles from the Hudson river, and is



GREEK VASE

mostly laid out as a park. The reports for 1919 showed: Professors and instructors, 121; students, 1,120. President, H. N. MacCracken, LL. D.

VASSAR, MATTHEW, an American philanthropist; born in Norfolk co., England, April 29, 1792. He emigrated to the United States, where he accumulated a large fortune. In 1861 he gave $428,000 to found VASSAR COLLEGE, (*q. v.*). He died while reading an address to the trustees of the college, June 23, 1868. By his will he left over $400,000 additional to the institution.

VATICAN, THE, the most extensive palace in the world, and, as the residence of the Pope, and the storehouse of valuable literary and art collections, one of the chief attractions of modern Rome. A building of the kind was erected on the Mons Vaticanus by Pope Symmachus about the year 500, near the anterior court of old St. Peter's and it was rebuilt by Eugene III. and enlarged by Nicholas III. The vatican did not, however supersede the Lateran as the usual residence of the Popes till their return from Avignon in 1377. The first conclave, held in 1378, resulted in the so-called Western Schism. In 1450 Nicholas V., with the object of making the Vatican the most imposing of palaces, began the work of combining with it the residences and offices of the cardinals, and the small portion completed by him, afterward occupied by Alexander VI., and named Tor di Borgia, was extended by subsequent Popes. The Sistine Chapel was erected by Sixtus IV. in 1473, and the Belvedere or garden house by Innocent VIII. in 1490. Bramante, under Julius II., united the latter with the palace by means of a great court, and constructed the Loggie round the Cortile di S. Damasco. By the erection of the library Sixtus V. divided Bramante's great court into two parts, the anterior court and Giardino della Pigna. The Pauline Chapel was the work of Paul III. (1534), and the present residence of the Popes was completed by Clement VIII. (1592-1605). The labor of extending and adorning the Vatican was continued by Urban VIII., Pius VII., and Gregory XVI.; and even Pius IX., amid the revolutionary struggles of the 19th century, found time to inclose the fourth side of the Cortile di S. Damasco by reconstructing the great staircase forming the approach from the colonnade of St. Peter's. The palace now comprises 20 courts and some 11,000 halls, chapels, saloons, and private apartments. Chief among its great art treasures are the Sistine frescoes of Michael Angelo and Raphael's Stanze and Loggie. The picture gallery is one of the richest in Rome, and the collection of antiquities is the finest in the world, including extensive Egyptian and Etruscan museums, and comprising among its classical sculptures the Torso of Hercules, the Laocoon, and the Apollo Belvedere. The library now contains 34,000 MSS.



SWISS GUARD OF THE POPE

VATICAN COUNCIL, the First Council of the Vatican, or the Nineteenth General Council, which assembled on Dec. 8, 1869. At the opening sitting 719 prelates were present, and the number rose in the following year to 764. The work done consisted of two constitutions —one, "Of the Catholic Faith," treating of the primary truths of natural religion, revelation, faith, and the connection between faith and reason; the other, "Of the Church of Christ," treating of the primacy of the Roman See, and defining the papal claims to authority over all

Christians. The first constitution was unanimously accepted in a session of 667 prelates, and confirmed by the Pope (Pius IX.) on April 20, 1870. The second constitution led to a long discussion; on May 13 the scheme, with the added clauses on Papal Infallibility, was laid before the Council, and on July 18 the bull *Pastor Æternus*, containing the constitution and the definition of Papal Infallibility, was read; 525 prelates voted in favor of it, two voted against it, while several absented themselves from the public session. The degree was then confirmed by the Pope. On the same day Napoleon III. declared war against Prussia; on Sept. 20 the Italian royalists took possession of Rome, and on Oct. 20 the Pope prorogued the Council, which has never reassembled.

VAUBAN, SÉBASTIEN LE PRESTRE DE, a military engineer and Marshal of France; born in Saint Léger du Fougeret, Burgundy, May 15, 1633. Left a destitute orphan at 10 he was brought up by the village curé, and at 17 enlisted in the regiment of Condé, then in league with Spain against the king. Taken prisoner in 1653, he was persuaded by Mazarin to take service under the king, and in 1655 he received his commission as one of the royal engineers. Already in 1658 he had the chief direction of the attacks made by Turenne's army, and the eight years of peace that followed this campaign he devoted to works at Dunkirk and elsewhere. In 1667 he helped to reduce Lille, and next was appointed governor of its new citadel. During the campaigns in Holland (1672-1678) he took part in 17 sieges and one defense, rising to be brigadier and major-general and at the close commissary-general of fortifications. He first introduced the method of approach by parallels at the siege of Maestricht (1673), and with such effect that that strong fortress capitulated in 13 days. The rest of his more famous exploits in these campaigns were the triumphant defense of Oudenarde and the sieges of Valenciennes and Cambrai. During the 10 years of peace which followed 1678 Vauban rendered to France perhaps the greatest of his services, in surrounding the kingdom with a complete cordon of fortresses, and he planned and partly executed the magnificent aqueduct of Maintenon, by which the waters of the Eure are conveyed to Versailles. In 1703 he rose to be Marshal of France.

War breaking out again in 1688, Vauban conducted with his usual success the sieges of Philipsburg—introducing here his invention of ricochet batteries—Mannheim, Mons (1691), and Namur (1692). The sieges of Charleroi (1693), Ath (1697), Breisach (1704), and the construction of the intrenched camp near Dunkirk (1706) are the only professional works of importance during the last 14 years of his life. After the peace of Ryswick in 1697 he had applied his active mind to the consideration of various faults in the internal government of France, and he had observed the fatal consequences of the Revocation of 1685. His ideas he submitted in a memoir to



SÉBASTIEN VAUBAN

Louvois and Madame de Maintenon in 1686. But another work, the "Royal Tithe" (1707), in which he discussed the question of taxation, and anticipated in the most striking manner the doctrines which 80 years later overthrew the French monarchy, brought down a heavier storm on his head. Saint-Simon tells us the book was clear, simple, and exact, but the truths it told were unpalpably plain. In 1699 and again in 1704 he had sent it to the king, but no notice was taken till in 1706 he began privately to print 300 copies, whereupon the book was at once condemned. Vauban did not long survive the disgrace, dying in Paris, March 30, 1707. "I have lost a man very devoted to my person and to the State," said his self-com-

placent master. His body was buried at Bazoches; in 1806 Napoleon deposited his heart in the Invalides.

VAUCLUSE (vō-klüz′), a department in the S. E. of France; bounded on the W. by the Rhone, and on the S. separated by the Durance from Bouches du Rhone; area, 1,381 square miles; pop. about 250,000. The E. is intersected by spurs of the Alps; in the W. are plains. Agriculture is the chief occupation; of late oaks have been largely planted for the culture of truffles; and there are manufactures of silk, wool, pottery, chemicals, etc. Originally composed of the county of Venaissin, the principality of Orange, and part of Provence, the department is divided into the four arrondissements of Apt, Avignon, Carpentras, and Orange, Avignon being the capital. The village of Vaucluse (*Vallis clausa*) stands in a romantic ravine 19 miles E. of Avignon, and is noted as having been for 16 years the residence of Petrarch, and for its famous fountain. Here, too, lived John Stuart Mill.

VAUD (vō) (German, Waadt), a canton which forms the W. corner of Switzerland; between the Jura and the Bernese Alps; area, 1,244 square miles; pop. about 320,000. It is a comparatively level district, traversed, however, by an elevated tract known as Mount Jorat, from which plains slope on either side to the Lake of Geneva on the S. and the Lake of Neufchâtel on the N. On both sides, near the mountains, there are extensive pasture lands, but the greater part of the country is highly cultivated. The vineyards yield white wines of excellent quality. Vaud forms part of French Switzerland; the religion is Protestant. After the fall of the Roman empire it belonged to the Burgundian kingdom, but in the 13th century it became a dependency of Savoy, and in 1536 the Bernese took possession of it. The French invasion put an end to the rule of Bern, and Vaud became a separate canton. The existing democratic representative constitution dates from 1845. Lausanne is the capital. See SWITZERLAND: WALDENSES.

VAUDEVILLE (vōd′vēl), a term originally applied to a country song of like kind with those written by Oliver Basselin, of the valleys of Vaux de Vire, in Normandy, in the 15th century. These songs, which were satirical, had for their subjects love, drinking, and passing events. They became very popular and were spread all over France under the name *Lais des Vaux de Vire*. The peculiarity of their character lived after their origin was forgotten, and plays, interspersed with songs of this description, came to be called Vaudevilles, and occasionally Virelais. Also a light gay song, frequently embodying a satire, consisting of several couplets and refrain burden, sung to a familiar air, and often introduced into theatrical pieces; a ballad, a topical song. In French drama a piece whose dialogue is intermingled with light or comic songs sung to popular airs. In the United States of late years the term has come into use to denote light or "variety" theatrical entertainments, especially when continuous.

VAUGHAN, BERNARD, an English Roman Catholic clergyman, born in 1847, a brother of Cardinal Vaughan. He was educated at Stonyhurst, and became a member of the Society of Jesus. As such, he took an active and conspicuous part in the religious and civic life of Manchester for eighteen years. In 1901 he moved to London, where he became well known as a worker among the poor, as well as a preacher. After traveling in the United States and Canada, where he lectured with great success, he also lectured at various times in Japan, China, Italy and France. Besides very numerous articles and pamphlets dealing with religious and social topics, many of his sermons have been published. He also wrote "The Sins of Society" (1906); "Socialism" (1910); "Socialism from the Christian Standpoint" (1913); "What of To-day?" (1914); "The Menace of the Empty Cradle" (1917); "The Workers' Right to Live" (1918); etc.

VAUGHAN, HENRY, a Welsh poet, styled "the Silurist" from his having been born among the Silures of South Wales; born in Newton, Brecknockshire, in 1622. He entered Jesus College, Oxford, in 1638, and shared the loyalty of his family, though apparently he did not actually bear arms in the cause. In 1650 he printed at London his "Sparks from the Flint-stone," a collection of pious meditations after the model of Herbert (second part printed with it in 1655), and followed it up in 1652 with "The Mount of Olives," a little book of devotions in prose, and the "Flores Solitudinis," also in prose. Not till the year 1678 was another collection of his verse published, and this time again by a zealous Oxford friend ("J. W.") without his concurrence. This was the "Thalia Rediviva: the pastimes and diversions of a Country Muse," a collection of elegies, translations, etc., of all periods of his life, closing with a few religious pieces ("Pious Thoughts and Ejaculations"), and a pastoral elegy on the death of his brother Thomas. He died April 23, 1695.

Vaughan's poetry is very unequal—his vein seems to have been a very hard, flinty soil, from which the right Promethean fire could be struck but now and then.

VAUGHAN, HERBERT, a Roman Catholic archbishop of Westminster; born in Gloucester, England, April 15, 1832; the eldest son of Lieutenant-Colonel Vaughan. Educated at Stonyhurst and on the Continent, he entered the priesthood, and in 1872 was consecrated bishop of Salford, in 1892 succeeded Cardinal Manning as Archbishop of Westminster, himself shortly after being raised to the cardinalate. He was an eloquent preacher, the founder of St. Joseph's College for foreign missions at Mill Hill, Hendon, and proprietor of the "Tablet," and the "Dublin Review." He died June 20, 1903.

VAULT, an arched roof; a concave roof, or roof-like covering, hence applied figuratively to the sky. In architecture, an extended arch covering an apartment so constructed that the stones, bricks, or other material of which it is composed sustain and keep each other in their places. Vaults are of various kinds; a cylindrical vault has a semi-circular arch; a covered vault has an arch which springs from all sides of its plan; a groined vault is one formed by two vaults intersecting at right angles. When a vault is of greater height than half its span, it is said to be surmounted, and when of less height surbased. A rampant vault is one which springs from planes not parallel to the horizon; the vault placed over another constitutes a double vault. A conic vault is formed of part of the surface of a cone, and a spherical vault of part of the surface of a sphere. A vault is simple when it is formed by the surface of some regular solid, and compound when compounded of more than one surface of the same solid, or of two different solids.

VAUX, FORT, fortified village of France, 4 miles N. E. of Verdun, which was the scene of much fighting during the spring and summer of 1916. On March 3 the Germans, having taken Fort de Douamont, about a mile to the N. E., turned their guns on Vaux. On March 8, the German infantry fought their way into the village from which the French succeeded in expelling them, a German bulletin announcing that the armored fort of Vaux had been occupied. The Germans hung on to the fringe till March 16, but did not reach the crest, and then after a fortnight's rest, an entire German division fought its way past the village of Vaux and Vaux Pond, scrambling over the rim of the Plateau de Douaumont which represented the northern slope of the Vaux Ravine through the Wood of La Caillette. The German loss of this attack was heavy, and within a few days the French had thrown them back on their old positions. This was part of what was called the "second phase" of the Battle of Verdun and the repulse of the Germans saved Verdun for the rest of the war. Attacks and counter-attacks were kept up during April, May and June. On June 1 the Germans began another important attack and on June 4 succeeded in isolating Fort Vaux. More German attacks followed on June 6 and on June 7 it was stormed and taken, remaining in German hands till November 2 when the French retook it. Later it fell again to the Germans who held it till its conquest by the American forces on June 1, 1918.

VECTOR, in mathematics, the same as RADIUS VECTOR (*q. v.*). Also a directive quantity, as a straight line, a force, or a velocity. The simplest manner in which to represent such a quantity, which involves both direction and magnitude, is by means of a straight line in space. Then the vector may be regarded as a stepping from one extremity of the line to the other. Vectors are said to be equal when their direction is the same and their magnitudes equal.

VEDA (from *vid*, "to know," hence "knowledge, [sacred] science"), the name of a body of religious writings which the Hindus believe to be divinely inspired. This body primarily consists of four collections (*samhitâ*) of hymns, detached verses, and sacrificial formulas —viz., the Rig Veda, or Veda of praises or hymns; the Sâma Veda, or Veda of chants or tunes; the Yajur Veda, or Veda of prayers; and the Atharva Veda, or Veda of the Atharvans—to each of which are attached certain theological prose works called Brâhmana, and intended chiefly to elucidate the meaning and application of the sacred texts, especially from a sacrificial point of view. The first three Vedas are often referred to as the "trayî vidyâ," or threefold science; and they alone must originally have formed the sacred canon, while the fourth Veda, which is less archaic in language, was not recognized till a later period. The Sahmitâs of the Sâma Veda and Yajur Veda are of a purely sacrificial and professional character, being intended to serve as textbooks for two of the four chief classes of priests—viz., the chanters (Udgâtar) and the offering priests (Adhvaryu) re-

spectively; and the verses contained in them are to a large extent taken from the Riksamhitâ, though not unfrequently with considerable textual variations. The Riksamhitâ, on the other hand, though likewise assigned to a special class of priests—viz., the invokers (or sacrificers, Hotar), is not a sacrificial text-book in the same narrow sense of the word; but it has rather to be looked on as a collection of all the sacred poetry which was within reach of the collectors, and seemed to them worthy of being preserved for devotional purposes.

The Rig Veda samhitâ has come down to us in a single recension, that of the S'âkala school. It consists of 1,028 hymns composed in various meters, and arranged in 10 books or mandalas. Book i. is mainly made up of 16 collections of hymns ascribed to as many poets belonging to different families. Books ii.-vii., on the other hand, are attributed each to a special family of Rishis or seers—viz., the Gritsamadas, Kus'ikas (or Vis'vâmitras), Vâmadevyas, Aatris, Bharadvâjas, and Vasishthas respectively—whence they are usually called the family books.

The Sâma Veda-samhitâ consists of two parts (or ârchika), the first of which contains the (585) verses to which the several sâman tunes are usually sung, while the second gives the text of the made-up chants in the order in which they are required in the sacrificial ritual. The tunes themselves, on the other hand, are given in four special tune-books, called Gâna, attached to the Samhitâ. The latter, consisting as it does mainly of detached verses taken from the Riksamhitâ, has only a technical interest. The mode of chanting somewhat resembled the Gregorian or Plain chant. The Brâhmanas of this Veda have a special character of their own, inasmuch as they are not different versions, or editions, of the same traditional exegetic and legendary matter, but altogether distinct treatises, dealing chiefly with chants.

The Yajur Veda offers the spectacle of a complete schism, its teachers and followers dividing themselves into an older and younger branch, or the Black and the White Yajur Veda, so called from the form in which their canonical books were handed down. For while the scriptures of the older branch presented a somewhat confused appearance, caused by the constant intermingling of the sacrificial formulas (yajus) and the exegetic portions (brâhmana), the younger school adopted the practice of the followers of the Rik by dividing their scriptures into a regular Samhitâ, or collection of sacrificial formulas and a Brâhmana.

The Atharva Veda-samhitâ is a collection of hymns and spells which, in importance and interest, ranks next to the Riksamhitâ. The two collections present two different aspects of the religious belief of the ancient Hindus. While the Rik reflects a simple belief in divine powers who are, on the whole, well disposed toward the Aryan man, and whose favor the worshiper is confident of gaining by his song, the Atharvan, on the other hand, reveals a superstitious dread of a host of malevolent powers, the effects of whose ill will man seeks to avert by means of incantations and magic practices. A recension discovered in Kashmir not only differs from it considerably in its arrangement, but also contains some new matter, amounting to about one-sixth of the whole. The Brâhmana of this Veda, the Gopatha (or cow-path)-brâhmana, containing cosmogonic speculations and explanations of certain sacrificial rites, is probably a comparatively modern work; while of the two ceremonial sûtras, the Vaitâna (or s'rauta)-sûtra and the Kaus'ika-sûtra, a manual of domestic rites, the latter is by far the more interesting. The Atharva Veda has also usually assigned to it a large number of Upanishads, amounting to considerably over 100. They are evidently of various ages, many of them coming down to very recent times.

VEDANGAS, what the Brahmans call "members of the Veda." They are six in number, but this name, says Max Müller ("Ancient Sanskrit Literature," p. 109), "does not imply the existence of six books or treatises intimately connected with their sacred writings, but merely the admission of six subjects, the study of which was necessary either for the reading, the understanding, or the proper sacrificial employment of the Veda." The six subjects or doctrines usually comprehended under the name Vedangas are: Sikshâ (=pronunciation), Chhandas (=meter), Vyâkarana (=grammar), Nirukta (=explanation of words), Jyotisha (=astronomy), and Kalpa (=ceremonial). The first two are considered necessary for reading the Veda, the two next for understanding it, and the last two for employing at sacrifices. The writers of the Vedangas do not claim inspiration.

VEDANTA, in India, a system of religion and philosophy professedly founded on the Vedas. It is divided into the Pûrva mimânsa and the Uttara mimânsa, or the former and the latter mimân-

sas, which constitutes two of the leading darsanas or schools of philosophy. As the first of these is chiefly practical, the Vedanta philosophy is mainly derived from the second. It was founded by Vyasa, and was modified by Sankara, its commentator. The former identified the world with God, and contended earnestly for the reality of the external universe which he held to have been created by God; the later Vedantists maintained that the universe is but an illusion projected by God, and is itself God. The present Vedanta system is Pantheistic. It has many adherents among the more educated Hindus.

VEDDER, ELIHU, an American painter; born in New York City, Feb. 26, 1836. He studied at Paris and in Italy, where he ultimately made his residence. His subjects are mostly ideal—"The Lair of the Sea-serpents," "Fisherman and Djin," "Death of Abel," "Greek Actor's Daughter," "Cumean Sibyl," "Nausicaa and her Companions." He also illustrated Edward Fitz-Gerald's "Omar Khayyám" (Boston, 1884). Author of "Digressions of V.," etc.

VEDDER, HENRY CLAY, an American historian; born in De Ruyter, N. Y., Feb. 26, 1853; was graduated at the University of Rochester in 1873 and at the Rochester Theological Seminary in 1876; was on the editorial staff of "The Examiner," a Baptist weekly, in 1876-1892; and was its editor in 1892-1894. In the latter year he became Professor of Church History at Crozer Theological Seminary. His publications include: "Baptists and Liberty of Conscience" (1885); "The Decline of Infant Baptism" (1890); "A Short History of the Baptists" (1891); "The Higher Criticism" (1892); "Talks with Baptist Young People" (1895); "The Decline of the Apostolic Succession in the Church of England" (1894); "A History of the Baptists of the Middle States"; "The Gospel of Jesus and the Problems of Democracy" (1914); etc.

VEGA CARPIO, LOPE FELIX DE, a Spanish dramatist; born in Madrid, Nov. 25, 1562. The story of Lope's life, as commonly told, is full of confusion. That he lost his parents early, was a student and graduate of Alcalá; a soldier in the Portuguese campaign of 1580, and in the Armada, 1588; secretary to the Duke of Alva, Marquis of Malpica, and Marquis of Sarria; had many amours, was twice married, and father of at least six children, three of them illegitimate; was banished from Madrid because of a quarrel, and lived two years at Valencia; took orders, became an officer of the Inquisition, and died at 73 a victim to hypochondria—all this is indisputable, but the order and relation of the facts are by no means clear.

The mere list of Lope's works presents a picture of unparalleled mental activity from boyhood to old age. He wrote plays, he says, in his 12th year, and certainly wrote some not much later, but his first work of any length was a characteristic attempt in 20 cantos to prove that his was the *miglior plettro* to which Ariosto left the completion of Angelica's story. It was written at sea in 1588, but was not printed till 1602. The "Arcadia" was written, as book V. shows, before the Duke of Alva's marriage, July, 1590, but it was kept back till 1598. The "Dragontea," a shout of exultation in 10 cantos over the death of the Dragon, Drake, the destroyer of Spanish naval supremacy, appeared at Valencia the same year, but a few months earlier, and was Lope's first publication with his name. But it was as a ballad writer that he first made his mark. The "Flowers of Romance," the little "Garlands" out of which the "General Romances" was formed, had begun to come out at Valencia when he was there in 1590-1592, and of the contributors of the Moorish and pastoral ballads in vogue "Belardo" (his name in the "Arcadia") was, we learn, the most esteemed. Of his miscellaneous works some, like those on St. Isidro and his canonization, and on the marriage of Philip III., are merely occasional, and others owe their escape from utter oblivion solely to his name. The more notable are the "Rimas" (1602), comprising the "Angelica," 200 sonnets, and a reprint of the "Dragontea"; the "Peregrino in His Country" (Seville, 1604), a romance on the model of "Theagenes and Chariclea," with a preface giving his views on the drama, and a list of the 219 plays he had already produced; the "Conquest of Jerusalem" (1609), an epic in 20 books in competition with Tasso; the "Pastores de Belén" (1612), a religious pastoral; "Filomena" and "Circe" (1621-1624), miscellanies in which he tried to rival the "Novelas" of Cervantes; the "Tragic Crown" (1627), an epic with Mary Stuart for heroine; the "Laurel of Apolo" (1630), a poem on the pattern of Cervantes; "Viage del Parnaso"; the "Rimas de Tomé de Burguillos" (1634), a collection of his lighter verse, with the "Gatomaquia," a mock-heroic. The most noteworthy of all is the "Dorotea" (1632), in form of a prose drama, but obviously the story of his own early love adventures from

1583 up to a little before the sailing of the Armada, with a prediction from an astrologer of his marriage, imprisonment, and banishment. In all he is credited with 1,500 comedies, of which more than 500 are extant and about 340 are well known.

VEGETABLE MARROW, a species of gourd cultivated as a culinary vegetable, and used fried, boiled, or otherwise.

VEGETARIANISM, a system popularly designated as limiting the human diet to foods obtained from the vegetable kingdom exclusively, and abstaining from all foods obtained from the animal kingdom. This is an approximately correct definition of what was meant by the word when the Vegetarian Society was founded in Manchester, England, in 1847. It was not long, however, before it was discovered that there was as great a need of discrimination in the use of the various products of the vegetable kingdom as there was cause to abjure the use of flesh. Vegetables are not all equally wholesome, some are absolutely poisonous. There is a great difference between the stalks and leaves and the seeds of plants. Cooked and uncooked foods differ greatly. The study of food leads to the study of equally important laws. Eggs, milk, cheese, butter (animal products) differ from the carcasses of slaughtered animals. Many of the arguments against the use of flesh do not apply to the use of fish.

Vegetarianism has spread so extensively that in addition to its pledged adherents it has a still greater number who practice abstinence from flesh to a greater or lesser degree in obedience to medical advice, for the curing or relieving of disorders of digestion, gout, and rheumatism. The Catholic Church enjoins abstinence from flesh during Lent, and on some other days during the year. Many religious orders (*e. g.*, the Trappists) abstain wholly from flesh. Brahmins also abstain from flesh and eggs. The Vegetarian Federal Union was formed in 1889. It offices are in London. To it are affiliated the Vegetarian Society, the London Vegetarian Society, a considerable number of other English societies, and those of the United States (founded in 1850), Germany, and Australia. An international congress was held in Cologne in 1889, and in London in 1890. There are now vegetarian restaurants in many large towns.

VEII (vē'yī), an ancient city of ETRURIA (*q. v.*); in early times the formidable rival of Rome, supposed to have been at Isola Farnese, 12 miles from Rome. It waged 14 distinct wars with Rome—an almost incessant warfare down to its capture after a 10 years' siege by Camillus (396 B. C.).

VEIN, in anatomy, one of a number of thin ramifying elastic tubes arising in the extremities of the body, and proceeding by a more or less direct course to the heart, to which they carry back the blood sent forth by the arteries and transferred to them by the capillaries connecting the two kinds of vessels. They fall under three great divisions: the pulmonary, the systemic veins, and those constituting the portal system. The pulmonary veins consist of four short venous trunks which carry the red blood back from the lungs to the left side of the heart, and which are found two on each side in the root of the corresponding lung. The systemic veins arise by small branches, which receive the blood from the capillaries throughout the body, and uniting to form larger vessels and then two large venous trunks, the superior and inferior venæ cavæ, finally enter the right auricle of the heart, into which the coronary veins also conduct the blood which nourishes that organ itself. These systemic veins are naturally divided into two groups according to the channel by which they enter the heart. The veins of the head, the neck, the upper limbs, the spine, the heart, and part of the walls of the thorax and abdomen, make their entrance into the right auricle by the superior vena cava, while those of the lower part of the trunk and the abdominal viscera do so by the ineferior vena cava. The veins of the portal system bring back the blood from the stomach, the intestines, the spleen, and the pancreas; then joining, they form the great portal vein which ramifies in the surface of the liver, after the manner of an artery, before finally entering the heart by the inferior vena cava.

In geology, a crack in a rock filled up by substances different from the rock. These may be either earthy or metallic. In very many cases the fissures have been produced by volcanic or earthquake action, and they often coincide with faults. Water descending by these fissures to unknown depths has been raised to so high a temperature that it has become capable of holding in solution various metallic and other mineral substances. As the water has cooled it has gradually deposited these matters held in solution, not doing so simultaneously, but in succession. Metalliferous veins vary greatly in width, being sometimes a few inches, frequently three or four

feet, and sometimes much more. The thinner portions often branch off into innumerable slender ramifications like the veins of an animal, whence their name. Sometimes part of the material filling veins has fallen in from above or been segregated from the rocks constituting the sides of the fissure. They are often parallel, are associated with dykes, and are more common in the palæozoic than in more modern strata. They vary in age, and not infrequently one crosses another. In mining, a lead or lode of ore-bearing rock, alive or dead; that is, containing ore or not; also a seam of metalliferous matter filling up a former fissure in rock.

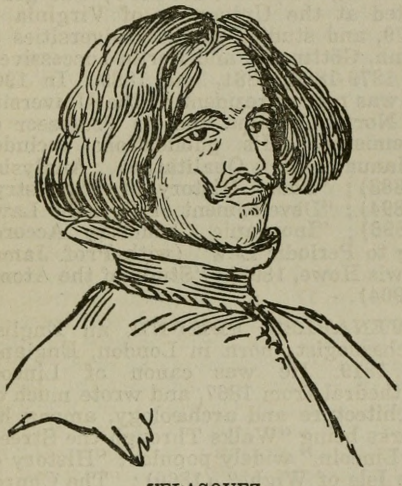
VEIT, PHILIPP (fīt), a German painter; born in Berlin, Prussia, Feb. 13, 1793. His mother, a daughter of Moses Mendelssohn, had for her second husband Friedrich Schlegel and Veit became devotedly attached to the religious and artistic ideas of his stepfather, like whom he embraced Catholicism. After finishing his studies at Dresden, he proceeded to Rome in 1815, and became a prominent member of that band of young German painters who sought to infuse into modern art the purity and earnestness of mediæval times. Of all the associates Veit ventured farthest into the obscure realms of symbolism and allegory. His first famous work was the "Seven Years of Plenty," executed as a companion piece to Overbeck's "Seven Years of Dearth," and forming part of a series of frescoes illustrative of the history of Joseph, painted at the Villa Bartholdy in Rome. Other pictures of his Roman period are: "The Triumph of Religion" (Vatican), "Scenes from Dante's Paradiso" (Massimi Villa), and an altarpiece, representing "Mary Queen of Heaven," in the Trinità de' Monti. These procured him so great a reputation that he was called in 1830 to the directorship of the Art Institute in Frankfort-on-the-Main. While holding this position he produced many grand pictures, of which the most celebrated is the large fresco (at the Institute) representing "Christianity Bringing the Fine Arts to Germany." In 1843 he removed to Sachsenhausen, opposite Frankfort, in 1853 to Mainz. He died in Mainz, Dec. 18, 1877.

VELA, VINCENZO, a Swiss sculptor; born in Ligornetto, Switzerland, in 1822; learned the trade of stone cutting; but in 1836 turned his attention to drawing. In 1847 he settled in Rome, and in 1848 was a volunteer in the Italian army during the war against Austria. He later removed to Turin and became celebrated by his statues. His works include: "Christ Raising the Daughter of Jairus"; "A Prayer"; "Spartacus"; "Harmony in Tears" (1855); "France and Italy" (1863); "Columbus and America"; "The Last Days of Napoleon"; "Spring"; etc. He was made an officer of the Legion of Honor in 1867. He died in Bellinzona, Ticino, Oct. 3, 1891.

VELASQUEZ, DIEGO RODRIGUEZ DE SILVA Y, a Spanish painter; born of a Portuguese family in Seville, June 5, 1599. From the studio of Francisco Herrera, an artist of note, he passed to that of Pacheco, whose daughter, Juana, he married in 1620. His early art, humble in aim and somewhat vulgar in type, is seen at its best in the "Water-Carrier" at Madrid, a work of characteristic vigor and keenness. To this early experience has been ascribed a certain want of elevation in his later work, an absence of the higher eclectic spirit manifested by tolerance of the painful or ugly. In 1622 he went to Madrid, where in the year following his portrait of Olivarez procured him the patronage of Philip IV., a wonderful portrait of whom at once established the fame of the painter. As court painter he produced many portraits of the royal family and of illustrious visitors, the latter including one of Charles I. of England, which has been lost. Velasquez formed a cordial friendship with Rubens during the diplomatic visit of the Fleming to Madrid in 1628. In 1629-1631 he made a tour in Italy visiting Rome, Naples, Florence, Venice, etc., and being received everywhere with the highest distinction. His style, already developed, bears little trace of Italian influence, but his admiration was sympathetically touched by the glory of Venetian art, and he expressly records his preference for Titian over Raphael and Michael Angelo. On his return to Madrid he made rapid progress in the royal favor; was made royal Ayuda de Camera or chamberlain (1643); his studio was removed to the palace, and there in friendly converse with the painter the king spent much of his leisure.

This relationship was undisturbed by Velasquez' grateful conduct to the disgraced favorite, Olivarez, and in 1648 he was sent by the king to Italy, commissioned to buy works of art. At Rome he painted the portrait of Innocent X., which is now the gem of the Doria gallery. He was subsequently appointed Aposentador Mayor, or royal seneschal, and in 1659 received the Cross of Santiago, an honor till then reserved for the highest nobility. But Valasquez did

not thrive under the load of honors; his health gave way in the service of the court; and he died in Madrid, Aug. 6, 1660. Though there are specimens of Velasquez in the galleries of London, Paris, Vienna, Munich, etc., it is only at Madrid that the range and resource of his art can be duly estimated. His portraits are not mere, "sallow, mustachioed Spaniards in black cloaks," but veritable human counterfeits, strong, vivid types of individuality, instinct with the subtlest shades of expression. The "Adoration of the Magi," his earliest-known picture, bears the date 1619,



VELASQUEZ

and among his better-known works are the "Boracchos," "Forge of Vulcan," "Joseph's Coat," "Surrender of Breda," a "Crucifixion," "Dwarfs," "Coronation of the Virgin," "The Meniñas" or "la Familia" (royal family), the "Hilanderas" or "Spinners," and, his last, "St. Anthony the Abbot Visiting the First Hermit St. Paul in the Desert" (1659), of which Wilke says it has "the very same sun we see, and the air we breathe, the very soul and spirit of nature."

VELAZQUEZ, DIEGO DE, a Spanish explorer; born in Cuellar, Spain, about 1460; accompanied Columbus to Española in 1493, and there distinguished himself in the wars against the Indians and amassed a fortune. In 1511 Diego Columbus appointed him to conduct an expedition against Cuba, and in the latter part of the year he landed on the E. shore at the head of 300 troops. He quickly conquered Hatuey the cacique, and put Panifilo de Narvaez, his lieutenant, in active command. The unarmed natives were soon overcome, and subjected to slavery, in which they soon perished. Later Velazquez established Matanzas, Trinidad, Santiago, and other places. In 1517 he joined Cordova in an expedition after slaves and they discovered Yucatan. Soon after, on learning of the rich Aztec empire, he fitted out an expedition for its conquest and placed CORTEZ (*q. v.*) in command. When the latter had reached the site of Vera Cruz he took independent command. Pafilo de Narvaez was sent to capture him in 1520, but was defeated. Velásquez died in Havana in 1522 or 1523.

VELLETRI, a town of central Italy, in the province of Rome; picturesquely situated on a spur of the Alban Hills, near the Pontine Marshes; 26 miles S. E. of Rome. It is the seat of the Bishop of Ostia, and has a cathedral (San Clemente), a classical school, a technical school, and several fine palaces. On March 19, 1849, Velletri was the scene of a defeat of the Neapolitan troops by the Roman Republicans under Garibaldi. Pop. about 20,000.

VELLORE, the most populous town of the district of North Arcot, Madras presidency, British India; near the left bank of the Palar river; 80 miles W. of Madras. The old fort, which was formerly very strongly garrisoned, now contains only a single regiment of native infantry. Inside there is a pagoda with beautiful stone carvings. A central jail has lately been built for 1,000 long-term prisoners, where excellent carpets, rugs, etc., are manufactured. Vellore was the scene of a mutiny in 1806, when the native Sepoys rose and murdered 113 European officers and soldiers. The outbreak was promptly suppressed. It was supposed to have been instigated by the sons of Tippoo Sultan, who had been confined in the fort as State prisoners since 1799. They were forthwith removed to the neighborhood of Calcutta, where the last survivor died in 1875. Pop. about 50,000.

VELOCITY, in all its significance, involves the notion of direction of motion as well as that of speed or rate of motion. The notion of speed is a very familiar one. In measuring it we assume the possibility of measuring space and time; and the unit of speed is that speed which a moving point would need to have in order to pass over the chosen unit of space in a unit of time. Such phrases as four miles per hour, one mile per minute, eighteen miles per second, are perfectly intelligible to all who know what a mile, hour, minute, and second are. It should be noted that when we speak of a man walking with a speed of four miles an hour we do not necessarily imply that

he really completes four miles, or that he walks for one hour, but only that he would do so were he to keep up that speed for the time named. In fact, speed is an instantaneous property of the moving point. Again since at every instant the moving point must be moving in a definite direction, as well as with a definite speed, it follows that velocity also is an instantaneous property. If it does not change from instant to instant, the velocity is constant, and the point moves in a straight line with constant speed. If the point moves in any other than a straight line, the velocity will be variable even although the speed should remain constant; and the most general change of velocity involves both change of direction and change of speed. Velocity is in fact a vector quantity, and may be treated mathematically as a VECTOR (*q. v.*).

The rate at which velocity changes is called acceleration. When the velocity changes in direction only, as when a point moves with constant speed in a circle, there is no acceleration in the direction of motion—*i. e.*, parallel to the velocity. The acceleration must therefore be wholly normal to the velocity, and will be toward the center of the circle in the simple case of uniform circular motion. If any change of speed occurs it is due to an acceleration acting parallel to the velocity, and therefore tangential to the path pursued by the moving point. When only a tangential acceleration exists, the point will move in a straight line with variable speed. A body falling vertically near the earth's surface gives a very good illustration of a pure tangential acceleration.

VELVET, one of the most familiar of what are known as pile fabrics. It is produced by adding to the usual warp and weft threads of plain weaving an additional row of warp yarns which are woven into the ground of the cloth, and passed over wires on the surface. In the case of a loop pile the wires are simply drawn out, but for velvet or other cut pile a knife is first passed along a groove on the top of each wire to cut the pile before the wire is withdrawn. Real velvet is made entirely of silk, but a kind is made with a silk face on a cotton basis. The name velveteen is, however, extended to fabrics in which silk and cotton are mixed throughout. Some of the richest and most artistic of the many splendid textiles woven on Italian looms in the 15th and 16th centuries were made, in part at least, of velvet. Similiar stuffs were also made in Spain and Flanders. Many of these were for ecclesiastical vestments, altar cloths, and the like, as well as for hangings. Plain velvets were likewise woven. The effect of a raised pattern in velvet on a plain or figured silk ground is often very beautiful. Sometimes a diaper design was formed of a long upon a short pile, called velvet upon velvet, and this too has a fine effect. Choice examples of these old velvet fabrics are preserved in some industrial art collections. Velvet is believed to have been first made in China. Modern velvets are largely made at Lyons and Crefeld.

VENABLE, FRANCIS PRESTON, an American chemist; born in Prince Edward co., Va., Nov. 17, 1856; was graduated at the University of Virginia in 1879, and studied at the Universities of Bonn, Göttingen, and Berlin successively in 1879-1880, 1881, and 1889. In 1900 he was made president of the University of North Carolina and its Professor of Chemistry. His publications include: "Manual of Qualitative Analysis" (1883); "Short History of Chemistry" (1894); "Development of Periodic Law" (1896); "Inorganic Chemistry According to Periodic Law" (with Prof. James Lewis Howe, 1898); "Study of the Atom" (1904).

VENABLES, EDMUND, an English archæologist; born in London, England, in 1819. He was canon of Lincoln Cathedral from 1867, and wrote much on architecture and archæology, among his works being "Walks Through the Streets of Lincoln," widely popular; "History of the Isle of Wight" (1860); "The Church of England: Its Planting, Settlement, Reformation. Renewed Life" (1886); "Bunyan" (1888). He died in Lincoln, March 5, 1895.

VENATION, the arrangement of the veins in the leaves of plants. If a leaf has only a single midrib without branches as in many *Coniferæ*, the venation is said to be simple. The three leading types of venation are the reticulated, netted, or angular, found in the exogens and a few aberrant endogens; the parallel, or curved, found in all the higher endogens; and the furcate, or forked, characteristic of ferns. Lindley made 10 divisions: veinless, equal-veined, straight-veined, curve-veined, netted, ribbed, falsely ribbed, radiating, feather-veined, and hidden-veined. Professors McCosh and Dickie considered that they had traced a connection between the ramifications of plants and their venation.

VENDÉE (vo*ng*-dā'), **LA**, a maritime department of western France; bounded on the W. by the Bay of Biscay, on the N. by Loire-Inférieure, and on the S. by Charente-Inférieure; area, 2,690

square miles; pop. about 450,000. The department, which owes its name to a small affluent of the Charente, is traversed from E. to W. by a range of hills, called in the E. the Plateau de Gatin, and in the W. the Collines Nantaises, and is watered in the N. by the affluents of the Loire, and in the S. by the Lay and the affluents of the Charente. Of its three divisions the W. is the Marais, occupied by salt marshes and lakes; the N. the Bocage, covered with plantations; in the S. and middle is the Plaine, an open and fertile tract. The coast line, 93 miles in length, presents few deep indentations, the chief being the safe Bay of Aiguillon.

VENDÉE, LA, WAR OF, the Royalist resistance to the French Revolution, which occurred chiefly in Vendée and Brittany. It broke out in Vendée, in March, 1793; gained a victory at Saumur, in June, 1793; but under La Rochejacquelin was decisively defeated by the Republican forces under Westermann and Marceau at Le Mans, Dec. 12, 1793. The struggle still went on in Brittany, under the name of the War of the Chouans; but was suppressed by General Hoche in 1796; and finally by Napoleon Bonaparte in 1800. The principal Vendean leaders were La Rochejacquelin, Cathelineau, Charette, and Stofflet.

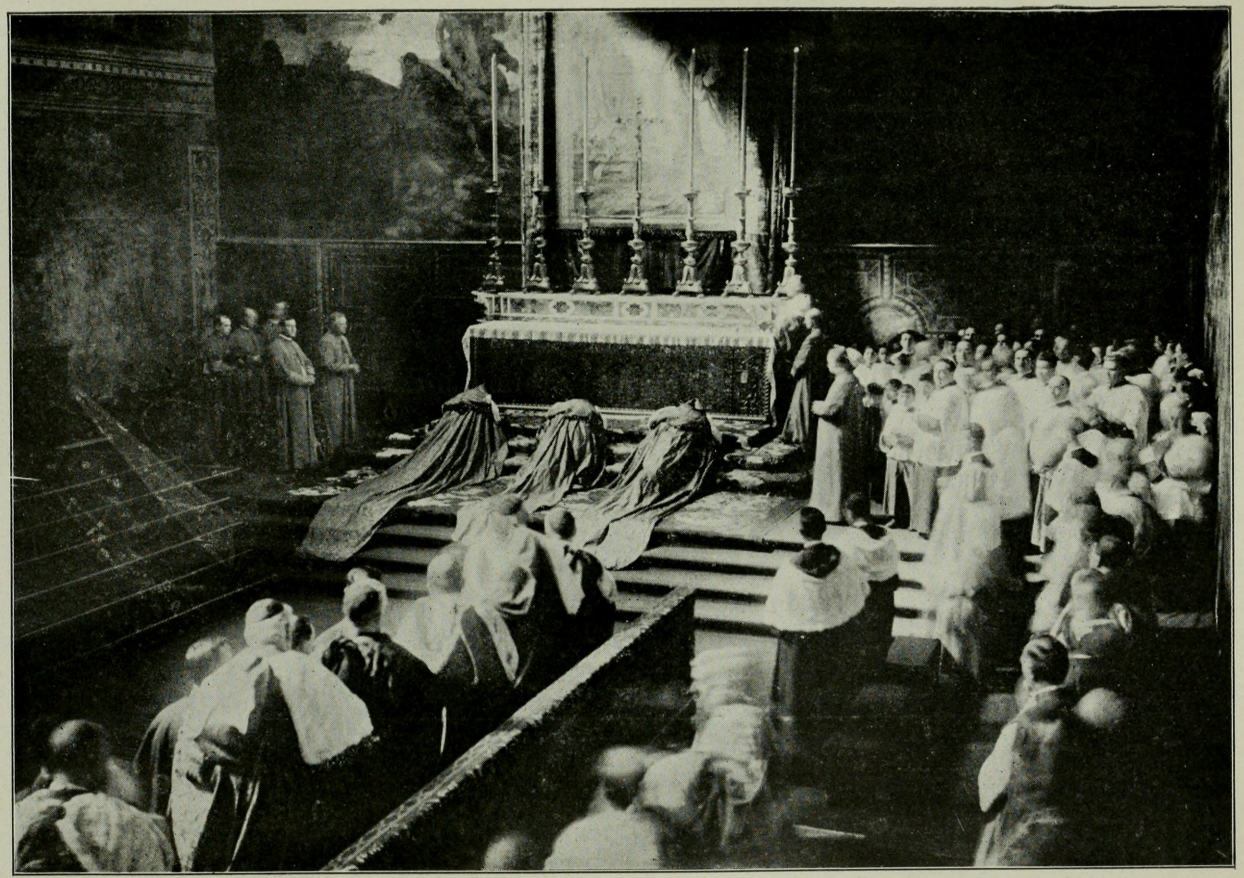
VENDÉMIAIRE (von*g*-dā-myār'), the first month in the French Republican calendar, beginning Sept. 22 or 23, and ending Oct. 21 or 22; so called from its being the vintage season.

VENDETTA, a particular case of the wider custom of blood-feud, by which every member of a stock, or body of men between whom blood relationship subsists, is bound to aid in taking vengeance (on the offender if possible, or on the stock to which he belongs) for a personal injury done to any of his kinsmen. The vendetta which exists in Corsica, and to a less extent in Sicily, Sardinia, and Calabria, is the practice of taking vengeance on the murder of a relative; and this duty is imposed primarily on the next of kin, but in a less degree on all the relatives of the murdered individual. If the murderer succeeds in eluding his pursuers, then vengeance may be taken on any of his relatives. Between 1770 and 1800, when the vendetta was at its height, some 7,000 murders are said to have occurred in Corsica owing to this practice of private vengeance. A law prohibiting the carrying of arms did much to put a stop to the vendetta, but the law is now repealed with the result that the number of murders is on the increase.

VENDÔME (von*g*-dōm'), a town of France; in the department of Loir-et-Cher; on the Loir; 42 miles N. N. E. of Tours and 111 S. W. of Paris. Above it rise the picturesque ruins of the castle of the Dukes of Vendôme, destroyed at the Revolution, and within the town is a fine 15th-century abbey church, with early Gothic tower and spire. Gloves and paper are made. Pop. about 10,000.

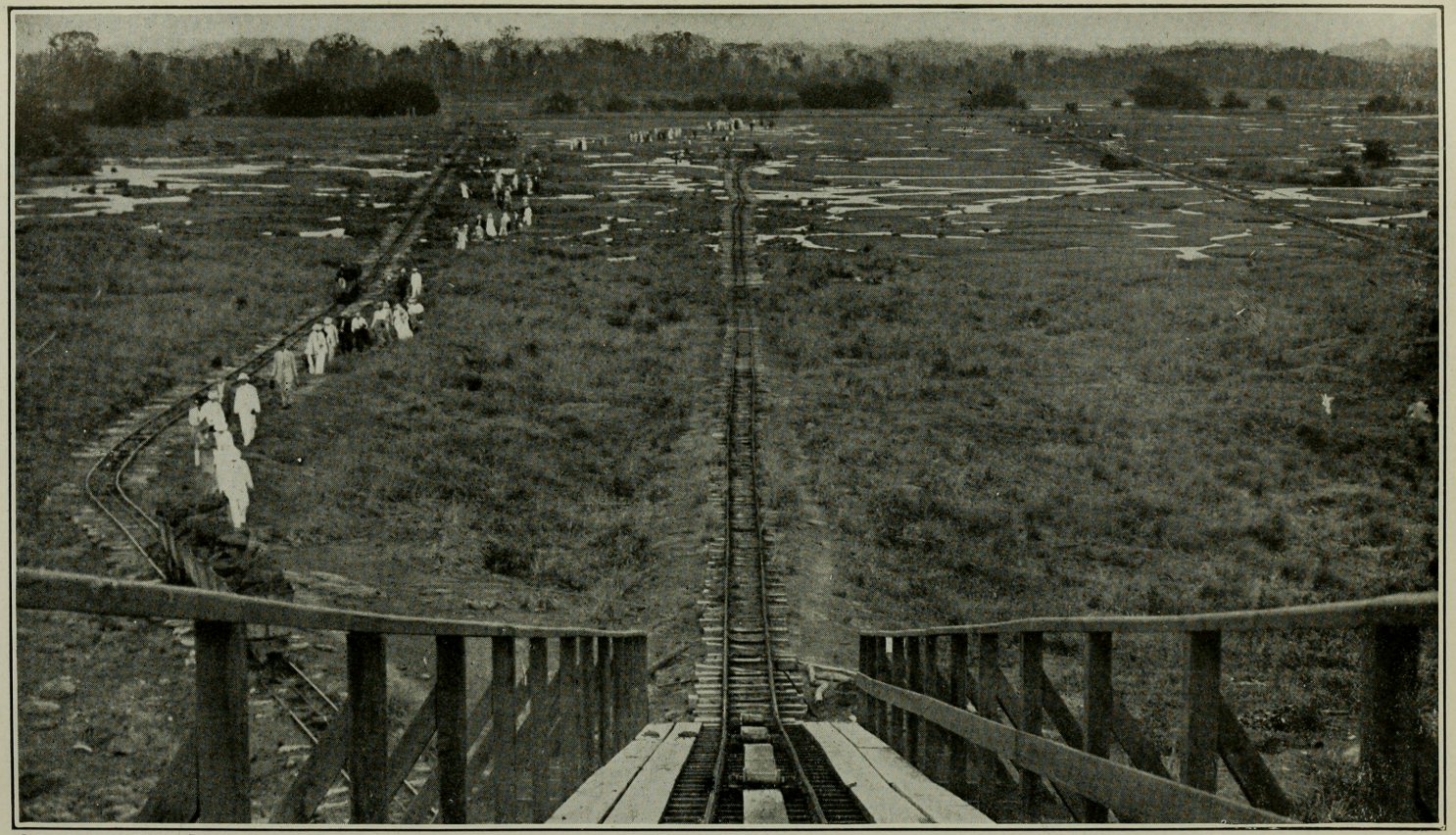
VENDÔME, an ancient countship of France; erected into a duchy by Francis I., for behoof of Charles de Bourbon, through whom it fell to his grandson, Henry IV., who again conferred it on César, the eldest of his sons, by Gabrielle d'Estrées. César's eldest son, Louis, Duke of Vendôme, married Laura Mancini, one of Mazarin's nieces, and had by her three sons, the eldest of whom was the famous soldier, Louis-Joseph, Duke of Vendôme, called till his father's death the Duc de Penthièvre. He was born in Paris, July 1, 1654, and saw his first service in the Dutch campaign of 1672. He next served with distinction under Turenne in Germany and Alsace, again in the Low Countries under Luxembourg, in Italy under Catinat, and received in 1695 the command of the army in Catalonia. He shook off his indolence, and closed a series of brilliant successes by the capture of Barcelona (1697). After five years of sloth and sensuality he superseded Villeroi in Italy, much to the delight of the soldiers. He fought an undecided battle with Prince Eugene at Luzzara (Aug. 15), then burst into the Tyrol, returning to Italy to check the united Savoyards and Austrians. On Aug. 16, 1705, he fought a second indecisive battle with Prince Eugene at Cassano, and at Calcinato he crushed the Austrians (April 19, 1706). That summer he was recalled to supersede Villeroi in the Low Countries under nominal command of the Duke of Burgundy. The defeat at Oudenarde (July 11, 1708) cost him his command, but in 1710 he was sent to Spain to aid Philip V. His appearance turned the tide of disaster; he brought the king back to Madrid, and defeated the English at Brihuega, and next day the Austrians at Villaviciosa. After a month of gluttony beyond even his wont, he died in Vinaroz, in Valencia, June 11, 1712. Saint-Simon hated Vendôme, and has gibbeted to all eternity his sloth, his gluttony, and his shameless debauchery.

VENEER, beautifully grained or figured woods which are, owing to their cost, rarely used in the form of solid boards, but cut into slices.



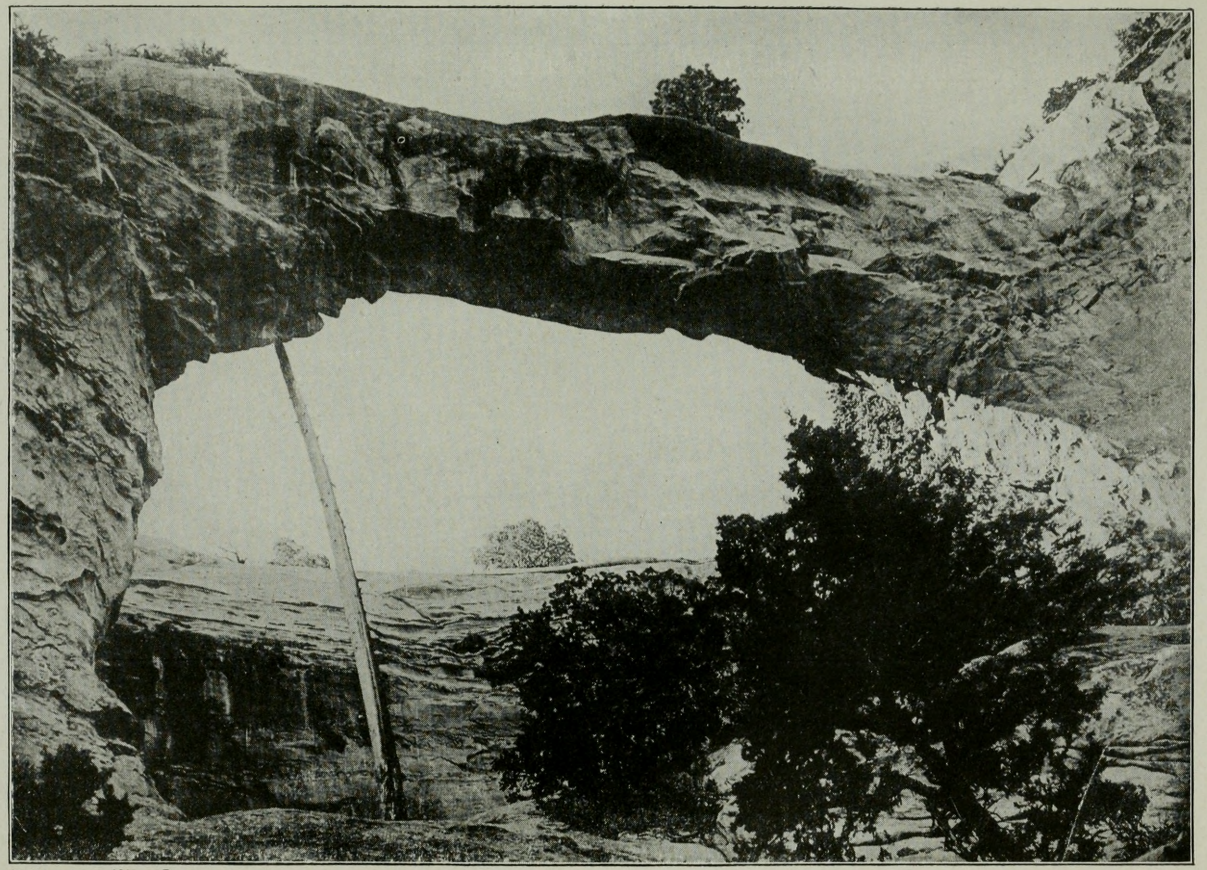
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THE PUBLIC CONSISTORY IN THE VATICAN WHEN ARCHBISHOP DENNIS J. DOUGHERTY OF PHILADELPHIA WAS ONE OF THE CHURCH DIGNITARIES ELEVATED TO THE CARDINALATE



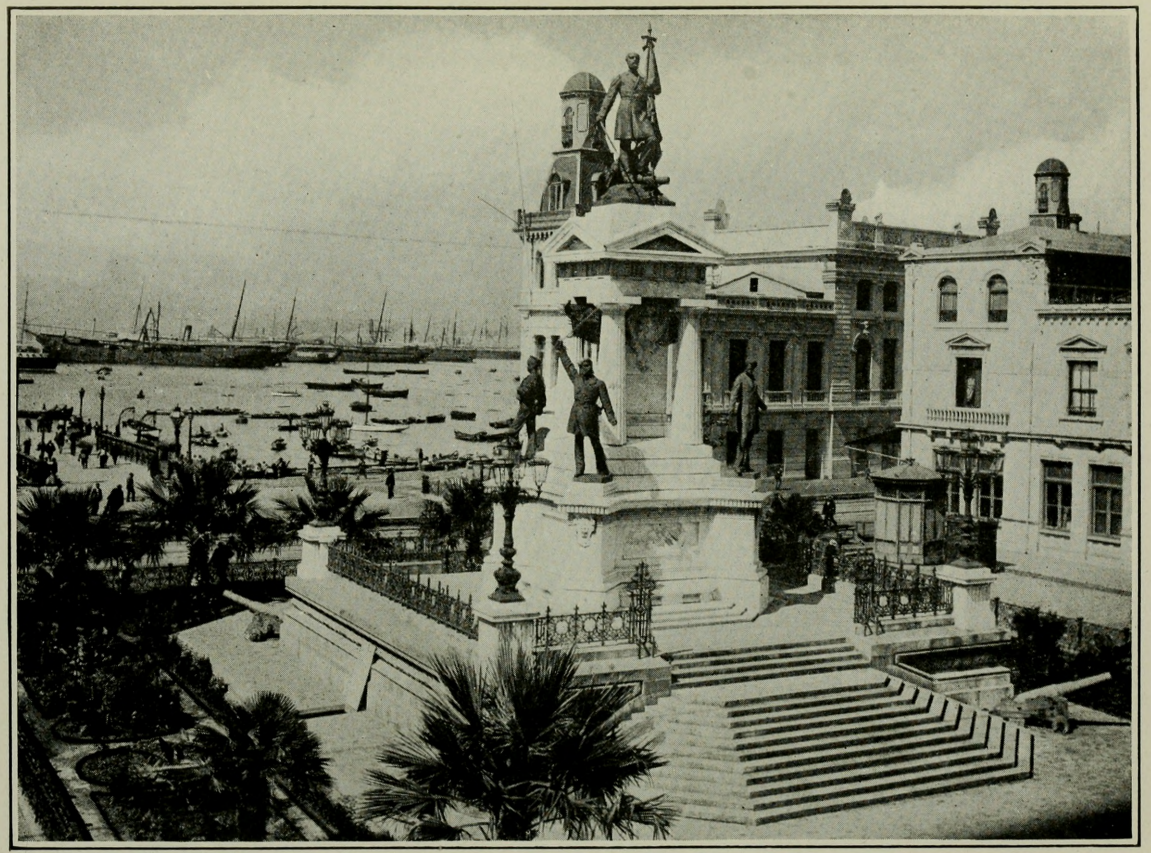
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THE FAMOUS PITCH LAKE FROM WHICH ASPHALT IS MINED, ISLAND OF TRINIDAD



©Keystone View Company

A NATURAL BRIDGE OVER CEDAR CANON, UTAH



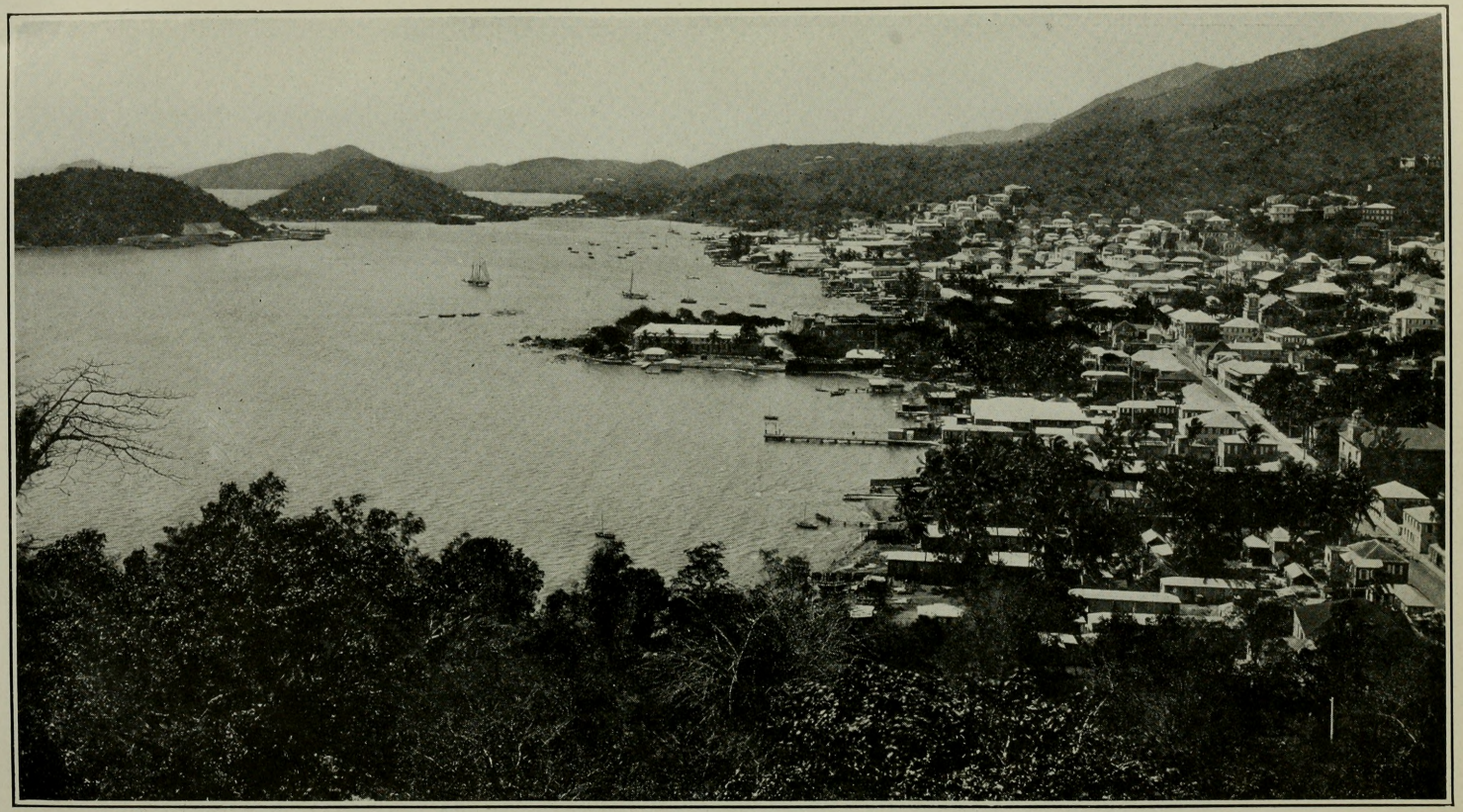
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THE HARBOR OF VALPARAISO, CHILE. THE MAGNIFICENT MONUMENT IN THE FOREGROUND IS THAT OF ADMIRAL PRAT



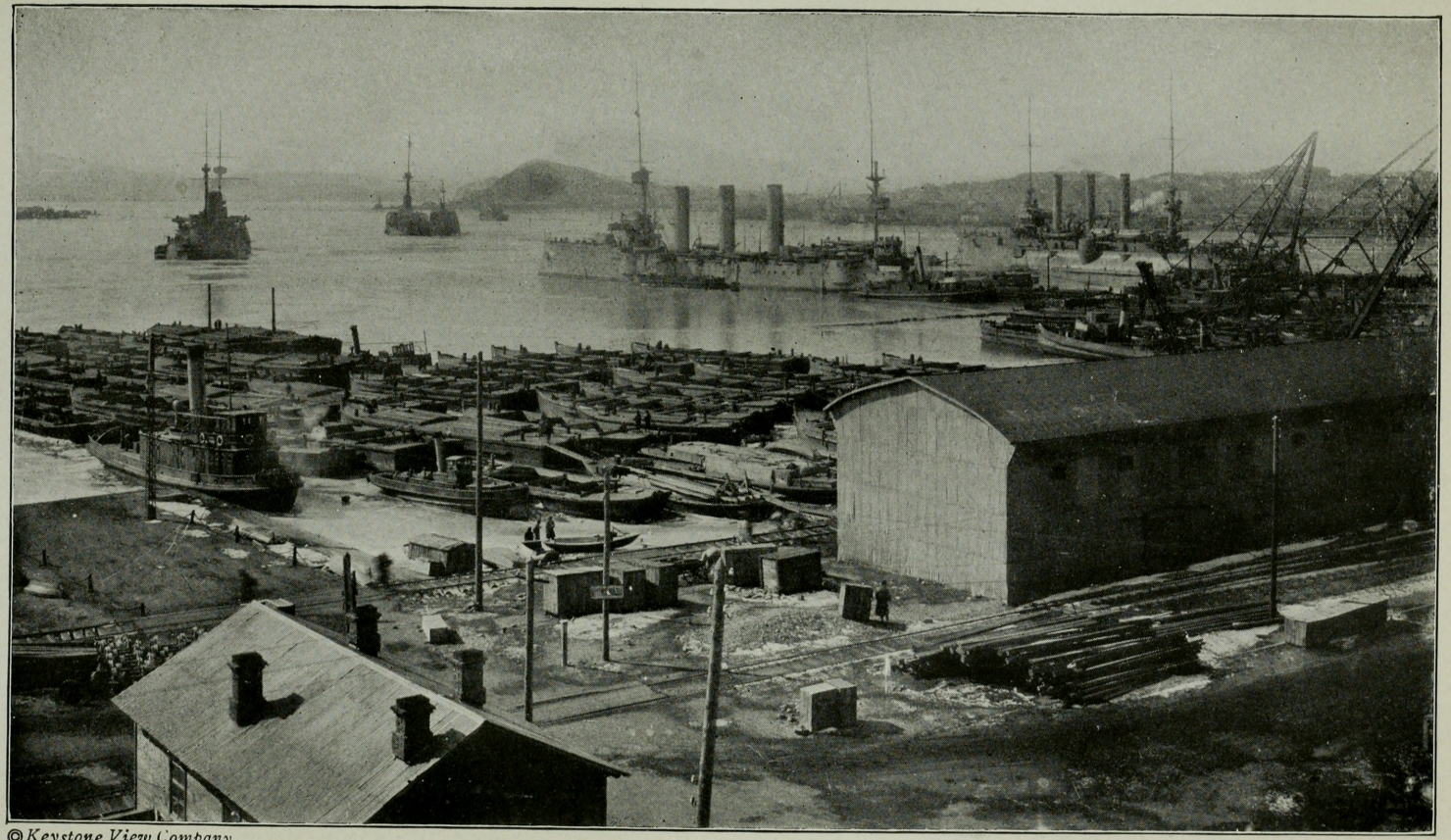
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THE ARSENAL, VENICE, SHOWING THE FAMOUS ANTIQUE LIONS AT THE ENTRANCE



©Brown & Dawson

THE CITY AND HARBOR OF CHARLOTTE AMALIE, VIRGIN ISLANDS



©Keystone View Company

THE HARBOR OF VLADIVOSTOK, ON THE PACIFIC COAST OF RUSSIA. THE AMERICAN ASIATIC SQUADRON IS IN THE HARBOR



©Ewing Galloway

A SCENE NEAR THE EASTERN END OF THE GRAND CANAL OF VENICE. THE DOMED CHURCH IS SANTA MARIA DELLA SALUTE

VENETIAN RED, a color said to be a native ocher, but the colors sold under this name are prepared artificially from sulphate of iron, or its residuum in the manufacture of acids. They are all of redder and deeper hues than light red, are very permanent and have all the properties of good ochers. Scarlet ocher, Prussian red, English red, and rouge de Mars are other names for the same pigment.

VENETIAN SCHOOL, a school of painting which arose and declined in the 16th century, and of which Titian (1477-1576) is considered the founder. Among its other masters were Giorgione (1477-1511), Tintoretto (1512-1594), and Paul Veronese (1528-1581). The distinguishing characteristics of this school were a mastery of color and a consummate knowledge of chiaro-oscuro.

VENEZUELA, a republic in the N. E. part of South America; bounded on the N. by the Caribbean Sea; on the W. by the United States of Columbia; on the S. by Brazil; and on the E. by British Guiana; lat. 1° 20′ to 12° 25′ N., lon. 59° 54′ to 73° 17′ W. Within recent years the country has been variously subdivided. In 1854 there were 13 provinces—those of Apure, Barcelona, Varinas, Barquisimeto, Carabobo, Caracas, Coro, Cumana, Guiana, Maracaibo, Margarita, Merida, and Truxillo—with an aggregate population of 945,908. Subsequently, the number of provinces was increased to 21 by subdividing eight of the original provinces. In 1863, after the Federals had conquered the Unionists, a confederation was formed, and the number of states was reduced to seven. The present distribution of the United States of Venezuela, according to the constitution, June 13, 1914, is into 20 states, a Federal district, and 2 territories. The area of the country claimed and occupied by Venezuela is 393,976 square miles; pop. 2,852,614. The capital is Caracas; pop. 90,720.

Topography.—The coast line extending from E. to W.—from the delta of the Orinoco to the boundary of the United States of Columbia—is 1,584 miles in length. Venezuela comprises the plains of the Orinoco basin, in continuation of the Amazon valley around the mountains of Guiana, partly separated from the Caribbean Sea by the N. E. range of the Andes. These plains are traversed by many rivers, the main river being the Orinoco, into which flow the Caroni and Ventuari, traversing and draining with their affluents the Guiana Mountains; the Atabapo, and other rivers. The Upper Orinoco is connected with the Upper Amazon by the channels of the Cassiquiare and the Rio Negro. The mountain system of the Andes extends N. and E. into Venezuela from Colombia. Between the N. and E. ranges is the low country of Lake Maracaibo basin. The country E. of this basin is an extensive mountain tract, some of the peaks reaching above the limit of perpetual snow. These mountains extend along the N. coast, in a double range, having fertile valleys between. There are other mountain ranges in the S. and E. The highest peak is the Sierra Nevada de Merida, reaching a height of 15,400 feet. Lake Maracaibo, in the extreme N. W., has an area of 8,392 square miles, and is connected by an outlet 8 miles wide, with a gulf of the same name; the waters of the gulf and lake together forming an inland waterway that penetrates the country more than 300 miles.

Climate.—The climate is tropical, and very hot in the valleys, the regions of the Lower Maracaibo basin being the hottest found on the W. continent. Above an altitude of 2,000 feet the climate becomes temperate, and cold above 7,000 feet. Much of the mountainous and plateau country has an elevation between these altitudes. The mean temperature at La Guaira is 82°, at Caracas 77°, but at Merida 61°. Wet and dry seasons alternate on the table lands. Rain is abundant in the mountainous regions.

Zoölogy.—Large regions of Venezuela, especially in the S. W. comprising the Upper Orinoco basin and plains, are still unexplored, much of the country being densely covered with forests, penetrable only with great difficulty. Fully one-half of Venezuela is unbroken forest. These forests abound in wild animals, insects, birds, and reptiles. There are many species of monkeys, all the varieties of South American *Felidæ*, tapirs, deer, ant eaters, the spectacled bear, the cabaiai sloths, etc. Aquatic birds in enormous flocks are found in the swamps, lakes, and rivers. Tortoises are plentiful, 50,000,000 eggs annually being taken for their oil. Manatees and porpoises ascend the Orinoco. The rivers, bays, and lakes abound in fish of many varieties.

Agriculture.—Agriculture is the principal industry, but is mostly confined to the N. mountainous belt, where the greater part of the population is concentrated. The principal products are coffee, cacao, sugar cane, tobacco, maize, cotton, and tropical fruits. Wheat is cultivated in some of the higher plains. Indigenous products, cultivated or gathered, include the tonka bean, rubber, copal, sarsaparilla, chinchona, many

beautiful cabinet woods, dyewoods, herbs, drugs, etc. The agricultural lands amount to about 135,000 square miles. Great herds of sheep, goats, and cattle are raised on the table-lands and mountain slopes, the export of hides and skins forming an important industry of the country. The area under coffee is estimated at from 180,000 to 200,000 acres. There are about 33,000 coffee plantations and about 5,000 cocoa plantations. The sugar plantations number about 11,000 with an annual production of about 3,000 tons. New sugar centrals have been established within recent years. About one-fifth of the population is engaged in agriculture.

Mineralogy.—Venezuela has important gold mines. The gold production in 1917 was 958,304 grammes. In 1918 the copper production amounted to 29,708 tons; and coal, 25,332 tons. Petroleum is found in many places, and there are valuable deposits of asphalt. The output in 1919 was nearly 50,000 tons. Copper, coal, salt, asphalt, silver, lead, tin, iron, sulphur, and petroleum are also found. Guano is exported, and bitumen is found in the river deltas and lake basins.

Commerce.—The imports in 1917-1918 amounted to £3,382,759, and the exports to £3,920,866. The principal exports are coffee, cocoa, balata, and rubber. The greater part of the trade is with the United States. Coffee constitutes about three-fourths of the entire export trade, and nearly six-sevenths of the import trade is subject to duty.

Communications.—There are 12 lines of railway, with a total length of 642 miles. The Great Railway of Venezuela, 111 miles long, runs between Caracas and Valencia.

Finances.—The revenue expenditures in 1919-1920 were estimated to balance at £1,948,634. The foreign public debt in December 31, 1918, was £5,763,866.

Government.—The government of Venezuela is a federative republic, having a President, elected for seven years, and a Congress of two houses.

Religion.—The State religion is Roman Catholic, but all other religions are freely tolerated. There are government universities at Caracas and Merida.

History.—The E. coast of Venezuela was discovered by Columbus in 1498; Ojeda and Vespucci followed in 1499, and entering Lake Maracaibo, they found an Indian village constructed on piles, to prevent the evil effects of inundation, and they named the place Venezuela, or little Venice, a name which afterward spread to the whole country. The first settlement was made at Cumana in 1520 by the Spaniards, and Venezuela remained subject to Spain, till it claimed independence in 1811. It then returned to allegiance to Spain, but again revolted in 1813, and, forming with New Granada and Ecuador the republic of Columbia, was declared independent in 1819. In 1830 Venezuela withdrew from the other members of the Free State founded by Simon Bolivar and declared itself a federal republic. The charter of fundamental laws dating from 1830 was amended in 1864 and 1881, and is quite similar to the Constitution of the United States of America.

In 1902 the claims of certain countries upon Venezuela caused complications so grave that it seemed that Venezuela and the United States would become involved in war with foreign powers. Germany blockaded Venezuelan ports and bombarded fortified coast towns. Feb. 13, 1903, Great Britain, Germany, and Italy signed protocols at Washington, providing for the settlement of the controversy. Finally, through the intercession of the United States, the controversy was submitted to The Hague Tribunal.

History.—The Hague Tribunal in February, 1904, pronounced in favor of the Allied Powers. Following the election of Castro as president, in 1905, there were serious internal and external troubles. Venezuela became involved with Colombia, France, Great Britain and the United States. Diplomatic relations were broken off with the United States and the Dutch made a naval demonstration in Venezuelan waters. Castro suddenly left the country in December, 1908, and the vice-president, Gomez, became acting president. He became provisional president in the following year. Castro attempted to return and assume his former power but was unsuccessful. A new constitution was promulgated in 1909 and in April, 1910, Gomez was chosen constitutional president. Castro's attempts to start a revolution were frustrated in 1911. The counry prospered under the firm rule of President Gomez. He was re-elected for the presidency in 1915. In the year previous a new constitution had been adopted and laws were enacted providing for compulsory education, public works, sanitation, and a new electoral system.

See COLOMBIA: VENEZUELAN BOUNDARY DISPUTE.

VENEZUELA, GULF OF. See MARACAIBO, GULF OF.

VENEZUELAN BOUNDARY DISPUTE. In 1855 a crisis arose between Great Britain and Venezuela regarding

the boundary line separating the latter country from British Guiana—a question which had been long in dispute. The controversy dated back to 1814, when Great Britain acquired by treaty with the Netherlands the province of Demerara, Essequibo, and Bernice. Venezuela originally claimed her limits to be those of the captaincy-general of 1810, but contented herself with claiming the line of the Essequibo river as the true boundary. Great Britain apparently acquiesced till 1840, when she commissioned Sir R. Schomburgk to lay out the boundaries, which he proceeded to do by including a large area which had before been considered by Venezuela a portion of her domain, and to the possession of which by Great Britain a vigorous protest was entered. After much diplomatic negotiations the monuments set up by Schomburgk were removed by the order of Lord Aberdeen. Other boundaries were from time to time suggested, but none agreed on, till finally, in 1886, Great Britain returned to her contention of 1840, and claimed all the territory within the Schomburgk line. The controversy continued till 1894, when a Venezuelan force entered the disputed territory and raised the flag of the latter country at Yuruan. The following year the British police removed the flag, for which they were arrested but finally released, Great Britain setting up a demand for reparation somewhat in the nature of an ultimatum.

The United States became a party to the dispute by the act of Congress directing the President to urge Great Britain to submit to arbitration the question whether Venezuela was entitled to the territory between the Essequibo and the Orinoco. In his annual message to Congress, Dec. 3, 1895, President Cleveland called attention to the boundary controversy and the representations made by the United States Government to that of Great Britain with a view of securing the submission of the dispute to arbitration. On the 17th he sent a special message to Congress, accompanied by the answer of the British Government to the representations mentioned, and a recommendation that Congress authorize the appointment of a commission to determine the divisional line between Venezuela and British Guiana. The message created intense excitement throughout Europe and America. Both Houses of Congress passed a commission bill unanimously and indulged in much talk of war. Under the bill the President announced, Jan. 1, 1896, the appointment of the following commissioners: David J. Brewer, Associate-Justice of the United States Supreme Court; Richard H. Alvey, Chief-Justice of the Court of Appeals of the District of Columbia; Andrew D. White, ex-United States minister to Russia; Frederic R. Coudert; and Daniel C. Gilman, president of Johns Hopkins University. Subsequently the commission organized and chose Justice Brewer its president.

The commission invited the governments of Venezuela and Great Britain to formulate and present to it their respective cases in support of their claims. The invitation was complied with by both governments. Independently of these cases the commission gathered a great mass of evidence bearing on the claims, and continued its sittings till Feb. 27, 1897, when, Venezuela and Great Britain having signed a treaty providing for the submission of the claims to arbitration, the commission considered its work at an end, made its report to the President, and terminated its existence. The treaty between Venezuela and Great Britain was signed in Washington, D. C., on Feb. 2, 1897, and provided for the appointment of an arbitration tribunal, to determine the boundary line, consisting of five jurists, the two on the part of Venezuela being Chief-Justice Fuller and Associate-Justice Brewer of the United States Supreme Court; the two on the part of Great Britain being the Rt. Hon. Baron Herschell and the Hon. Sir Richard Henn Collins; and the fifth to be selected by the four jurists nominated in the treaty, or, in the event of their failure to agree, by the King of Norway and Sweden, the fifth jurist to be the president of the tribunal. The treaty provided that the tribunal should sit in Paris, France. The tribunal was completed by the selection of Professor Maertens, a distinguished Russian jurist, Professor of International Law in the University of St. Petersburg, and legal writer, as the fifth member and president. The award of the tribunal, which was delivered Oct. 3, 1899, gave Great Britain the Schomburgk line, with the exception of Barima Point, at the mouth of the Orinoco, and a strip of territory between the Wenamu and Cuyuni rivers; but it was decided that the mouth of the Orinoco should be open to the British, and both banks of a part of the Cuyuni, where the Schomburgk line had given them only one bank.

VENIAL SIN. The distinction made in Roman Catholic theology between mortal sin and a venial sin was first made in connection with Church discipline. St. Augustine, in his book of "Faith and Works," distinguishes sins into two kinds; greater, or those which obliged men to do public penance, and which he

called mortal; and lesser, such as sins of the tongue and thoughts, and the immoderate use of lawful things, which he called venial, not because they were not mortal in their own nature, but because in comparison with the others they were of an inferior nature, and not so easily proved on men; and because men were cleared from them without the humiliation of a public penance, by private repentance, and daily prayer and reformation. The same distinction is made in the writings of many of the early Fathers. The sins for which public penance had to be undergone were all enormous sins, such as idolatry, apostasy, divination, murder, adultery, theft, and sacrilege. But this is not the distinction which is made in later theology in connection with the doctrines of purgatory and auricular confession, and especially in the writings of the casuists. There is so much diversity of opinion among the writers themselves that no precise definition of a venial sin can be given, further than that they are those minor sins to which even the best are liable, and from which even those who escape the punishment of hell have to be purified in purgatory before they can enter to heaven.

VENICE, a city of California, in Los Angeles co., on the Pacific Electric railway. It was formerly called Ocean Park and is one of the largest and most popular amusement resorts on the Pacific Coast, being frequented both in summer and winter. Its chief attraction, aside from its resemblance to Venice, Italy, based chiefly on its system of street canals, is its excellent surf bathing. Pop. (1910) 3,119; (1920) 10,385.

VENICE (Italian, Venezia), a province of northeastern Italy; bounded S. E. and E. by the Adriatic Sea, and remarkable for its long series of lagoons, which, stretching due N. for 25 miles from the mouth of the Brenta to that of the Sile, occupy a considerable part of the old bed of the Piave; area 934 square miles; pop. about 400,000. The lagoons contain numerous small islands (on some of which the city of Venice itself stands) that are separated from the open sea by a peninsula which is partly composed of the alluvium brought down by the rivers, and partly of the sand thrown up by the waves. Being, however, intersected by both artificial and natural channels, access to the coast, as well as to the capital, is thereby obtained. Products, all kinds of cereals, with rice, maize, hemp, silk, and wine.

VENICE, a celebrated city of northeastern Italy, capital of the above province and of the former Venetian republic; near the N. extremity of the Adriatic, 70 miles W. of Trieste. The city is built entirely on piles driven into about 117 small islands situated in the shallow waters of the Bay of Venice, and known as the lagoons, a kind of lake shut out from the deeper water of the Adriatic Sea, by a ridge or long but interrupted belt of sand and earth called the Littorale, which extends about 2 miles from the shore, shutting in all the islands and lagoons from the Adriatic Sea. A modern viaduct, supported on 222 arches, part of the Verona and Venice railway, has lately united the continent with the Littorale or protecting beach of the city. The 117 islands on which the city is built are separated from each other by narrow channels, which serve the purpose of thoroughfares, being constantly traversed by gondolas, a light river boat, answering the purpose of cabs and omnibuses, and depositing passengers at any house or building at which they may desire to alight. The whole series of islands are connected with each other by some 450 bridges. Some of the islands are large enough to have what may be regarded as two or three short streets with intersecting lanes or alleys, but in general they only present blocks of buildings, having river fronts, according to the direction of the canal, or the water frontage of the isle. The longest and most important street in Venice, the Merceria, is only 15 feet wide; carriages and horses are unknown in Venice, the gondola being the universal means of transit to those going from shop to shop or house to house.

Venice is nearly 8 miles in circumference, contains about 28,000 houses, and is divided into two parts by the Grand Canal, or Canal Grande. Over this canal there are three bridges, that of the Rialto, the most magnificent bridge in Venice, consisting of a single arch 90 feet in span and 24 feet in height, built of marble in 1590. Two ranges of shops divide its upper surface into three narrow parallel streets. Venice is regarded as one of the finest cities in Europe, and was for many centuries the capital of the first maritime and commercial state in the world. It consequently contains proportionally a larger number of public buildings and palatial residences than any other city in Europe; among the most celebrated of its national edifices, first mention must be given to that stupendous building, the pride and glory of Venice, the ducal palace of St. Mark, with the cathe-

dral of St. Marco, forming three sides of a square, the grandest and most imposing quarter of all the city. The square of St. Mark—with its arcades, its fine and elegant shops and cafés, the vast grandeur of its ducal residence containing all the chambers of state, audience, and judicature, and its magnificent cathedral—presents a picture of grandeur and beauty unequaled by any capital in Europe. The Bridge of Sighs (*Ponte dei Sospiri*) stretches across the canal called the Rio Palazzo, and communicates between prisons on the E., and the Doge's palace on the W. bank of the canal. It is a covered gallery; and prisoners, when led to execution, passed from their cells across this gallery to the palace, to hear sentence of death passed upon them, and then were conducted to the scene of death between the red columns.

Few cities in Italy are richer in works of pictorial art than Venice; some of the masterpieces of Titian, Tintoretto, Paul Veronese, and the other great chiefs of the Venetian school, are to be found in all the churches of this extraordinary city. The library (a fine marble structure, containing 120,000 volumes and 10,000 MSS.), the museum, and cabinet of curiosities of St. Mark's are regarded as the finest in Europe. The arsenal and dockyard are esteemed as worthy objects of attraction; the latter, in the palmy days of Venice, contained 40 line-of-battle ships, 12 of them three-deckers, with arms for 150,000 men, 4,000 pieces of ordnance, and an immense amount of naval and military store, with provision and every requisite to maintain its reputation as one of the first commercial and maritime states in the world. For many centuries, in the Middle Ages, Venice had the monopoly of all the glass sold to Europe; but this has long since passed away, and its chief trade is now confined to the manufacture of mirrors, jewelry, artificial pearls, silks, velvets, and porcelain.

The foundation of Venice was laid in 421, as a place of refuge during the invasion of Italy by Attila. In 697 took place the establishment of an elective prince or Doge, with the appellation of Serene Highness—Paoluccio Anafesto being the first Doge or Duke of Venice. At first the power of the Doge was absolute, but in time restrictions were placed on his rule, till eventually he became a mere cipher and symbol of authority in the hands of the famous Council of Ten. The prosperity and power of Venice began with the dawn of the 9th century. In 1133, the Doge Sebastino received from Pope Alexander III. the title of Sovereign of the Adriatic, in consequence of a signal victory gained by the Venetian galleys over the fleet of the emperor, when, further to mark his joy at the victory, the Pope flung into the gulf a ring of great cost, as a mark of gratitude—a custom afterward annually followed by the Doges, who, in great state, dropped a rich ring into the sea; this ceremony was called espousing or wedding the Adriatic. In the reign of Giovanni, in 1620, gold was first coined in Venice, the coin from the ducal dignity of the prince being called a ducat. Venice at this time was at the height of its glory as the first maritime and commercial state in Europe, as the most prosperous of nations, and as a leading military and political power. Jealous of the rising influence of the republic of Genoa, already encroaching on the commerce of the East, which Venice considered as her exclusive monopoly, she for more than a century carried on a harrassing war with her rival, sometimes with serious loss, at others with advantage. In 1396 Genoa placed herself under the dominion of the King of France, and therefore ceased to have a separate existence as an enemy of the republic. The greatest part of the 15th century was passed in repeated wars with the Turks, who captured many of her Greek and Ionian islands, especially Cyprus, and large portions of Dalmatia. When the commerce of Venice became annihilated by the discovery of the route to India by the Cape, petty quarrels and political jealousies occupied the Venetians, instead of commerce and dominion. From this time the prestige of Venice declined, and her power gradually sank as a state till, on the occupation of Italy by the armies of the French Republic, Venice—after an independent existence of 1,300 years—without striking a blow became a part of Napoleon's Cisalpine republic, and afterward of the Italian kingdom. At the Congress of Vienna, 1815, Venice was annexed to Austria. The city and territory were ceded to and incorporated with the kingdom of Italy in 1866.

During the World War Venice was repeatedly bombed by hostile airplanes, and measures were taken to prevent its treasures from destruction. Pop. about 150,000.

VENICE, GULF OF, an arm of the Adriatic Sea, on the N. E. coast of Italy, bounded by the Brenta and the Piave.

VENI CREATOR SPIRITUS, an ancient and celebrated hymn of the Roman Breviary, which occurs in the offices of the Feast of Pentecost for Vespers and Tierce, and in the Pontifical for the Ordination of Priests, Consecration of Bishops or of a Church, the "Ordo ad Synodum," and some other solemn services. Its authorship has been ascribed to Charlemagne, also to Gregory the Great, St. Ambrose, or Rabanus Maurus. It was translated by Bishop Cosin, again by Dryden, whose version was adapted by John Wesley and Toplady. The labors of more than 30 later translators have not stripped this noble hymn of all its dignity. The Veni Creator Spiritus must not be confounded with another hymn to the Holy Ghost, Veni Sancte Spiritus, Et emitte coelitus, the "Golden Sequence," which ranks among the masterpieces of Latin sacred poetry. The latter belongs not to the Breviary, but to the Missal, in which it forms a Sequence in the Mass of Pentecost Sunday and Octave. It is in five stanzas, each consisting of six lines of seven-syllable trochaic verse. It is certainly not older than the beginning of the 13th century. It has been variously ascribed to King Robert II. of France, to Hermannus Contractus, to Stephen Langton, and, with perhaps most probability, to Pope Innocent III. The best translations are those by Caswall and by Neale.

VENIRE FACIAS (ve-nī'rē fā'shyas) (Latin, "that you cause to come"), in law, a writ or precept directed to the sheriff, requiring him to cause a jury to come or appear in the neighborhood where a cause is brought to issue to try the same. This writ was abolished in England in 1852, but the precept issued by the justices of assize, which is substituted, is sometimes loosely spoken of as a *venire*.

VENIZELOS, ELEUTHERIOS, a Greek statesman, born in 1864 on the Isle of Crete. He was educated in the schools of Athens and at Athens University, where he graduated from the law department in 1886. Returning to Crete he soon established a reputation as a brilliant lawyer. He became a member of the Cretan Legislature at the age of 25. During the Cretan revolution of 1890-1892, he took a prominent part and was appointed Minister of Justice in 1899. His constant desire was for the political union of Crete and Greece and in 1908 he was the leader of the movement which aimed to bring this about. He was chosen Premier of Crete in 1910, but shortly afterward, at the request of the military league, removed to Athens, where he took a prominent part in revising the constitution. From 1910, when he became Premier, he was the central figure in events in the Balkans. Largely through his efforts was organized the Balkan League, which waged successful war against Turkey. See BALKAN WARS. He took a leading part in the negotiations which followed this war. At the outbreak of the World War, Venizelos appeared as an active champion of the Entente, and urged the participation of Greece on that side. See GREECE. When Greece finally joined the Allies, Venizelos became the practical dictator of the country. At the Peace Conference, he was one of the chief figures, and was declared to have been the most able statesman present at the Conference. Chiefly through his efforts, Greece was given the large areas of territory which she claimed. Venizelos bitterly opposed the return of Constantine to the throne, following the conclusion of the war, but in a plebiscite held in the latter part of 1920 he was defeated and withdrew from the country.

VENLO, or **VENLOO**, a town of the Netherlands, in Limburg, on the Meuse, at the junction of several railways. In its earlier days it was strongly fortified and was the scene of many sieges and battles, having been at different times in the possession of France, Holland, England, Austria, Belgium, and the Netherlands. Its principal industries are the manufacture of tin, lead, and tobacco, together with brewing and tanning. Pop. about 20,000.

VENTILATION. See HEATING and VENTILATION.

VENTNOR, the principal town on the S. shore of the Isle of Wight; 11 miles S. by W. of Ryde. Situated amid the finest of the fine scenery of the Undercliff, it has a S. exposure, well sheltered from the N., and so possesses a mild climate, suitable for various classes of invalids. The beach is composed of beautiful yellow shingle; and fossils are found in great quantity in the vicinity.

VENTRICLES. See HEART.

VENTRILOQUISM, the art of speaking in such a way as to cause a hearer to believe that the sound comes, not from the person speaking, but from a different source. The name originated from the erroneous supposition that the sounds uttered were formed in the belly, whereas practice alone is necessary to carry this act of illusion to a high degree of perfection. The sounds are formed by

the ordinary vocal organs—the larynx, the palate, the tongue, the lips, etc. The art of the ventriloquist consists merely in this: After drawing a long breath he breathes it out slowly and gradually, dexterously modifying and diminishing, the sound of the voice; besides this he moves his lips as little as possible, and by various contrivances diverts the attention of his auditors. This art was known to the ancient Greeks.

VENUE, in law the place where an action is laid. In the United States, the county in which the trial of a particular cause takes place is said to be the venue of that trial. In local actions, as for damages for an actual trespass, or for waste, etc., affecting land, the plaintiff must lay his declaration, or declare his injury to have happened in the very county and place that it really did happen; but in transitory actions, for injuries that might have happened anywhere, as debt, detinue, slander, and the like, the plaintiff may declare in what county he pleases, and then the trial must be had in that county in which the declaration is laid. To lay a venue is to allege or fix a place of trial. To pray a change of venue is to petition that a cause may be tried before another judge or in another place than the one first selected.

VENUS, in Roman mythology, the goddess of beauty and love, and more especially of sensual love, her principal seats being the island of Cyprus and Cythera. This goddess is generally supposed to have been of eastern origin, and to have been the same as the Phœnician Astarte. Before her identification with the Greek Aphrodite, the daughter of Zeus and Dione, who, according to some accounts, arose from the foam of the sea, Venus was one of the least important divinities. The Romans regarded her as the progenitress of their nation, which was fabled to have sprung from Æneas, the offspring of her union with the Trojan Anchises. She was married to Vulcan, but was not remarkable for fidelity to her husband, and her amour with Adonis has been celebrated by classic poets and by Shakespeare. The rose, myrtle, and apple were sacred to her; among birds, the dove, swan, and sparrow were her favorites. She is generally represented with her son Cupid in a chariot drawn by doves, or, at other times, by swans or sparrows. Among the most famous statues of Venus are the Venus of Cnidus, by Praxiteles (of which the Venus de Medici, found at Tivoli, is supposed to be a copy), the Venus of Capua, and the Venus of Milo or Milos, found in the island of Milos. In the best days of art she was always represented as draped, in later times nude.



VENUS OF MILO

VENUS, in astronomy, the second of the known inferior planets, if the arrangement be made according to their relative distances from the sun. With the exception of the moon Venus is nearest of all the heavenly bodies to the earth, and, when near its extreme E. or W. elongation, is much brighter than even the largest of the fixed stars. It stands first in this respect also of all the planets, the nearest approach to it being that made at certain times by Jupiter. When Venus is at its maximum of brightness, it can sometimes be seen by the naked eye in sunlight with-

in an hour of noon. Its comparative nearness to the sun causes it to be for six months a morning and for the other six months an evening star. In the first state, it is the Lucifer of the Latins and the Phosphor of the Greeks; in the latter, it is the Hesperus of classical antiquity and of modern poetry. It undergoes phases like the moon. Father Castelli, a famous Florentine philosopher, reasoned this out, and, questioning Galileo on the subject, induced him to look with his telescope and see. On Dec. 30, 1610, he was able to announce to Castelli that the phases had been actually discerned. They are not visible to the naked eye, to which the planet is simply a brilliant speck, too small to reveal its actual form, which is much more globular than that of the earth. Its diameter is about 7,826 miles, or about 93 miles less than that of the earth. Were man placed on the surface of Venus, the earth would look a trifle larger and brighter than Venus does to us in our sky. The mass of Venus is about three-quarters that of the earth, or $\frac{3}{422000}$ that of the sun; its density is about 0.850 that of the earth; its sp. gr. 4.81, as against 5.66, that of the earth. While a stone falling toward the earth passes through a little more than 16 feet in the first second, it would, if falling to the surface of Venus, pass through about 13 feet only in the same time. The excessive brightness of Venus makes the time of its rotation somewhat doubtful; it is provisionally placed at 23 hours 21′. Its mean distance from the sun is 67,000,000, its greatest distance 67,500,000, and its least 66,600,000 miles. These numbers show that its orbit departs but slightly from a circle. Its periodic time is 224.7 mean solar days. Observation on the passage of the planet over the sun's disk is the best method of ascertaining the distance of the great luminary; it has also revealed the fact that Venus has an atmosphere, but its composition is as yet uncertain. Old observers thought they detected a satellite; modern astronomers have not confirmed this view, and believe it to have been founded on optical delusion.

VERA CRUZ, a State of Mexico; bounded on the E. by the Gulf of Mexico and on the N., W., and S. by the States of Tabasco, Chiapas, Oajaca, Puebla, Hidalgo, San Luis Potosi, and Tamaulipas. It extends in a strip about 50 miles wide along the coast, and has an area of 27,880 square miles. The coast strip with the exception of the N. part is in places narrow, flat, low, and rolling, with occasional swamps, lagoons, and hills. On the Puebla boundary line rises Mount Orizaba, the highest peak in Mexico, and some believe the highest peak in North America. In the lowlands of the S. E. portion there are occasional spurs, including the volcano of Tuxtla, which is nearly 5,000 feet high. Many short rivers flow down from the mountains, of which the navigable Panuco in the N. is the most important. The climate on the coast is warm and in summer unhealthy. The more elevated parts are temperate and healthy. Agriculture is the chief industry of Vera Cruz, the products including tobacco, coffee, sugar, vanilla, etc. Pop. about 1,300,000.

VERA CRUZ, the principal port of Mexico; on the E. coast, in a low, unhealthy plain, backed by drifting sand-hills; 263 miles E. of the City of Mexico. There is no harbor, but only an open roadstead between the city and the island castle of San Juan de Ulua, which, with two shore batteries, defends the port. The streets are wide and straight, with numerous squares, and low, picturesque houses of various colors. The chief buildings are the cathedral, custom house, and casino; a number of the churches have been perverted into tobacco factories. The moist, hot climate of Vera Cruz is notoriously unhealthy, and the annual death rate ranges from 1 in 11 to 1 in 20 of the population, mostly from lung diseases, and from yellow and other fevers. The fierce "northers," if they often drive vessels ashore from the exposed anchorage, at least are of use in sweeping away the fevers for a time. Most of the commerce is in the hands of foreigners; nearly 600 vessels enter and clear annually. The full title of the city is Villa Nueva de la Vera Cruz, or New City of the True Cross. The old town was founded by Cortez in 1520 on the spot where he had landed the year before; the new one dates from 1580. The royal forces held out in the castle till November, 1825. The castle capitulated to the French in 1838, and to General Scott in 1847; and during the French occupation the town was the base of supplies from 1862 to 1867. In 1914 the city was captured and held for several months by American forces. See MEXICO. Pop. about 50,000.

VERAGUA, DUKE OF, a title conferred on the lineal descendants of Christopher Columbus. It was first borne by Luis Columbus in 1536. From him it passed to Diego Columbus, the great-grandson of the famous discoverer. He died childless in 1578, and the

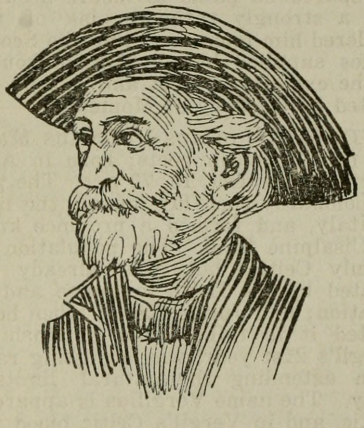
male line of Columbus came to an end. A lawsuit for the succession to the title followed, and after 30 years was settled in favor of the descendants of Isabel, sister of Luis Columbus. This line coming to an end in 1733, the title was, after more litigation, settled on the descendants of Francesca, sister of the Diego Columbus who died in 1578. The Duke of Veragua, the 13th in direct descent from Christopher Columbus, was born in Madrid, Spain, in 1837. In 1893, with his wife, he visited the United States on the invitation of the government, and witnessed the opening ceremonies of the Columbian Exposition. He was everywhere received with high honors as a representative of the family.

VERB, in grammar, that part of speech which predicates something in regard to something else (the subject or thing spoken of); as, The man *lives*, The boy *threw* a stone. Verbs affirm action or existence of a subject under certain conditions or relations called voice, mood, and tense. Verbs may be classified into: (1) Transitive, requiring an object, as he *learns* his lesson; and (2) Intransitive, as, He *runs*. Transitive verbs include reflexive verbs. Some transitive verbs are reflex in meaning though not in form, and appear, at first sight, as if used intransitively; as, He *keeps* out of danger, *i. e.*, He *keeps himself*, etc. Sometimes a transitive verb has a passive sense with an active form; as, The cakes *are* short and crisp. Some verbs are sometimes transitive and sometimes intransitive; as, He *floats* a scheme, The body *floats*. Only transitive verbs have a passive voice. Some intransitive verbs, by means of a preposition, become transitive, and so may be used passively; as, He *laughed at* the act, The act *was laughed at by* him. Intransitive verbs include a large number that might be classed as frequentative, diminutive, inceptive, desiderative, etc. Some intransitive verbs have a causative meaning, and take an object: I *run*, I *ran* a pin into my finger. Intransitive verbs may take a noun of kindred meaning as object (called the cognate object); as, to *sleep* a sleep, to *run* a race, to *live* a life. Verbs used with the third person only are called impersonal verbs; as, me*thinks*, it *rains*, it *snows*. In the case of some verbs, the transitive form is distinguished from the corresponding intransitive by a change of vowel; as *raise, rise; set, sit; fell, fall*. Such verbs are called causative. The past tense of strong verbs is expressed by a change of vowel only; as, *throw, threw*; the past tense of weak verbs by adding to the verbal root the syllable *-ed;* as *shout, shouted;* or its euphonic substitute *d* (*-ed*); as *love, loved*. Auxiliary verbs are used in forming the tenses of other verbs; as, I *have* seen.

VERBECK, GUIDO FRIDOLIN, a Dutch-American missionary; born in Zeist, Holland, Feb. 1, 1830; was graduated at the Auburn Theological Seminary, Auburn, N. Y., in 1859, and in the same year was sent to Japan by the Reformed Church of America. The Japanese government engaged him in 1863 to carry on educational work. He was superintendent of instruction and teachers in the foreign department at the Imperial University, Tokyo, in 1869-1873; was engaged in missionary work work in 1873-1879, and was then again employed by the government as a translator and organizer. In 1891 he was made instructor of theology in the Meiji Gakuin. He was the author of "History of Protestant Missions in Japan" (1883) and the translator of "The Code Napoleon"; "Two Thousand Legal Maxims"; etc. He died in Tokyo, Japan, March 9, 1898.

VERBENA, a genus of plants of the natural order *Verbenaceæ*. The genus consists of numerous species of herbs or shrubs which inhabit the tropical and subtropical parts of the world; most numerous in America, more rare in Asia and Africa. They have opposite leaves, sessile bracteated flowers in simple or panicled spikes, terminal or axillary; a tubular five-toothed calyx, tubular corolla more or less curved with a spreading limb, generally unequally lobed; four stamens, included in the tube, the upper pair sometimes without anthers; a slender style with capitate stigmas. The ripe fruit splits into two or four nutlets, each containing one seed. The genus is more remarkable for the beauty of a number of the species, which under cultivation have given origin to numerous varieties greatly prized for their brilliant colored flowers, than for other virtues, though formerly the English species was credited with potent medicinal qualities, particularly in ailments of the bladder and in the cure of defective vision, which, however, appear to have been purely imaginary. It was also worn on the person as a protection against blasts and to promote general good fortune, for which purpose it was gathered with special observances and ceremony. The lemon-scented verbena is *Aloysia citriodora*, which belongs to the same natural order; but the perfumers' oil of verbena is derived from the lemon grass.

VERDI, GIUSEPPE, an Italian composer; born in Roncole near Busseto, Italy, Oct. 9, 1813. At 10 years he was organist of the small church in his native village; at 16 he was provided with funds to prosecute his studies at the conservatorium at Milan; but at the entrance examination he showed so little evidence of musical talent that the authorities declined to enroll him. Nothing daunted, he pursued his studies under Lavigna from 1831 to 1833, when, according to agreement, he returned to Busseto to take the place of his old teacher Provesi, then deceased. After five unhappy years in a town where he was little appreciated, Verdi returned to Milan. His first opera, "Oberto, Conte di S. Bonifacio," is chiefly indebted to Bellini, and the next, "Un Giorno di Regno" (which fulfilled its own title, as it was only once performed), has been styled "un Bazar de Reminiscences."



GIUSEPPE VERDI

"Nabucodonosor" (1842) was his first hit, and in the next year "I Lombardi," was even more successful—partly owing to the revolutionary feeling which in no small degree was to help him to his future high position. Indeed, his name was a useful acrostic to the revolutionary party, who shouted "Viva Verdi," when they meant "Viva *V*ittorio *E*manuele, *R*e *D'I*talia." "Ernani," produced at Venice in 1844, also scored a success, owing to the republican sentiment in the libretto, which was adapted from Victor Hugo's "Hernani." Many works followed in quick succession, each rousing the enthusiasm of the audiences chiefly when an opportunity was afforded them of expressing their feelings against the Austrian rule. Only with his 16th opera did Verdi win the supremacy when there were no longer any living competitors; and "Rigoletto" (1851); "Il Trovatore," and "La Traviata" (1853) must be called the best, as they are the last of the Italian opera school. "I Vespri Siciliani" (1855) and "Simon Boccanegra" (1857) were not so successful as "Un Ballo in Maschera" (1859); and none of them any more than "La Forza del Destino" (1862) or "Don Carlos" (1867) added anything to the fame of the composer of "Il Trovatore." Only now begins the interest which the student of musical history finds in Verdi's life. Hitherto he had proved a good man struggling with adversity and poverty, a successful composer ambitious to succeed to the vacant throne of Italian opera. But the keen insight into dramatic necessity which had gradually developed and had given such force to otherwise unimportant scenes in earlier operas also showed him the insufficiency of the means hitherto at the disposal of Italian composers, and from time to time he had tried to learn the lessons taught in the French Grand Opera school, but with poor success. Now a longer interval seemed to promise a more careful, a more ambitious work, and when "Aïda" was produced at Cairo (1871) it was at once acknowledged that a revolution had taken place in Verdi's mind and method, which might produce still greater results. The influence of Wagner and the music drama is distinctly to be felt, and the andvantage of more deliberate work. But Verdi was apparently not yet satisfied. For 16 years the successful composer maintained absolute silence in opera, when whispers of a great music drama roused the expectation of musical Europe to an extraordinary pitch; nor were the highest expectations disappointed when "Othello" was produced at Milan in 1887. The surrender of Italian opera was complete, and Verdi took his right place at the head of the vigorous new school which has arisen in Italy and which promises to regain for the "Land of Song" some of her ancient pre-eminence in music. A comic opera, "Falstaff," was produced in 1893 by the composer; a Requiem Mass (1874) is his only important non-operatic work. He died in Milan, Italy, Jan. 27, 1901.

VERDIGRIS, or **VERDEGRIS**, in chemistry, a green pigment prepared in the S. of France, by exposing thin plates of copper for some time to the action of the refuse of the grape from which wine has been made. In the United States it is sometimes prepared by placing copper plates in contact with woolen cloths, which have been soaked in pyroligneous acid. It is soluble in

dilute sulphuric acid, and is very poisonous. In pharmacy, verdigris is occasionally used externally, in powder or mixed with honey and vinegar, as an escharotic.

VERDUN, a fortified French town in the department of Meuse; 35 miles W. of Metz. It has 11 forts, a cathedral, and manufactures of iron, liquors, sweetmeats, leather, and beer. In 843 a famous treaty was made here between the Emperor Lothaire and his brother Ludwig the German, by which the Frankish empire was divided in three. The fortress has been often besieged; as it was in 1870 by the Germans for six weeks, when it capitulated. It was the last place held by Germany, given up only in September, 1873. Verdun played a great part in the World War. It was greatly strengthened, and in 1916 withstood the assault of great German armies for months, and by its successful defense saved France and the war for the Allies. Pop. about 15,000. See WORLD WAR.

VERESHTCHAGIN, WASILIY, a Russian historical painter; born in Tcherepovets, Russia, Oct. 26, 1842; was educated at the naval school at St. Petersburg. In 1864 he entered the Art School at Paris, where Gerôme was his master. He joined the Caucasian expedition under General Kaufmann in 1867, and in 1869 went to Siberia. In 1874 he went to India with the Prince of Wales, and afterward settled in Paris. He took part in the Russo-Turkish War, and was wounded at Plevna. His pictures are of immense size, extremely realistic, and treat chiefly of the horrors of war. In 1904 he went to Manchuria to study scenes and events in actual warfare, and was lost April 13 on the man-of-war Petropavlovsk blown up by a submarine mine, just out of Port Arthur harbor. He thus brought a brilliant career to a sudden close.

VERGENNES, CHARLES GRAVIER, French statesman; born in Dijon, France, Dec. 28, 1717. After a diplomatic career in Germany, Turkey and Sweden, he became Louis XVI.'s minister of foreign affairs, and, by promoting the independence of the United States, concluded the alliance of 1778. He died in Versailles, Feb. 13, 1787.

VERGIL, POLYDORE, an Italian author; born in Urbino, Italy, about 1470. He had his education at Bologna, and seems to have commenced life under the patronage of Guido Ubaldo, Duke of Urbino, to whom was dedicated his first work, "Proverbiorum Libellus" (1498), an earlier book than the "Adagia" of his friend Erasmus. His second, "De Inventoribus Rerum" (1499), which was also the earliest book of its kind, became extremely popular, and was translated into English, Spanish and Italian. His "Historiæ Anglicæ Libri XXVI." appeared at Basel at 1534; the 27th book, bringing the story down to 1538, was added in the third edition (1555). About 1550 he obtained a license from Edward VI. to return to Italy for his health's sake, without losing his livings, and next he traveled to Urbino, where he lived in quiet till his death in 1555. His history is a work of great research, vigorous and independent, written in clear and elegant Latin. It is the fullest original narrative for the reign of Henry VII., and here Hall has simply translated his Latin into English. As regards Wolsey, the value of his evidence is discounted by his strong prejudice. He spared no pains to insure accuracy, and a strongly rational bias of mind hindered him from accepting the Scottish fables supplied him by Gavin Douglas, or the exploits of Brut and Arthur warranted by Geoffrey of Monmouth.

VERGIL (PUBLIUS VERGILIUS MARO), the first of Latin poets; born in Andes near Mantua, Oct. 15, 70 B. C. The plain of Lombardy then lay outside the limits of Italy, and formed a province known as Cisalpine Gaul. The population was mainly Celtic, but was already permeated by the Latin language and civilization; and Julius Cæsar, when he admitted it to full Roman citizenship in Vergil's 21st year, was adjusting rather than extending the natural limits of Italy. The name Vergilius is apparently Celtic, and in Vergil's Celtic blood modern cities have found the origin of his romantic and melancholy temper, and of the deep sense of natural beauty and the spirtual meaning of nature, in which he stands alone among Greek and Latin poets.

Vergil's father owned a small property in his native place, where, besides the ordinary work of a farm, he occupied himself in forestry and bee-keeping. He was well enough off to give his son the education which was generally confined to a wealthier class. The boy was sent to school at Cremona and Milan, and at the age of 16 went to Rome and studied rhetoric and philosophy under the best teachers of the time. His studies were probably interrupted by the civil war; at all events, we know nothing of the next years of his life till 41 B. C. The victorious triumvirs were then providing for the immense armies which had been disbanded after the battle of Philippi by

settling them on confiscated lands throughout Italy. Vergil's farm was part of the confiscated territory of Cremona; but his reputation as a rising poet had already brought him under the notice of the governor of the district, Asinius Pollio, himself a distinguished man of letters. By Pollio's advice he went to Rome, with special recommendation to Octavianus; and though his own property was ultimately not restored to him, he obtained ample compensation from the government, and became for a few years one of the circle of endowed court poets who gathered round the prime minister Mæcenas.

In 37 B. C. the "Eclogues," a collection of 10 pastorals modeled on those of Theocritus, were published, and received with unexampled enthusiasm. Soon afterward Vergil withdrew from Rome to Campania. The munificence of Mæcenas had placed him in easy and even affluent circumstances. He had a villa at Naples, and a country house near Nola, within easy reach of it; and he seems to have lived almost entirely in this neighborhood during the seven years in which he was engaged in the composition of the "Georgics," or "Art of Husbandry." This poem, which is in four books, and deals with tillage and pasturage, the cultivation of trees, especially the vine and olive, and the breeding of horses, cattle and bees, appeared in 30 B. C., and confirmed Vergil's position as the foremost poet of the age. The remaining 11 years of his life were devoted to a larger and in some respects more uncongenial task, undertaken at the urgent and repeated request of the emperor, the composition of a great national epic. During these years he lived a secluded life, chiefly in Campania and Sicily; he seems also to have traveled in Greece, and to have paid occasional visits to Rome, where he had a house in the fashionable quarter on the Esquiline. The subject he chose was the story of Æneas, the Trojan, the legendary founder of the Roman nation and of the Julian family, from the fall of Troy to his arrival in Italy, his wars and alliances with the native Italian races, and his final establishment in his new kingdom. By 19 B. C. the "Æneid" was practically completed, but Vergil had set apart three years more for its final revision. In the summer of that year he left Italy with the intention of traveling in Greece and Asia; but at Athens he fell ill, and returned only to die at Brundusium a few days after landing, on Sept. 21. He had almost completed his 51st year. In his last illness he expressed a wish to burn the "Æneid," and he left directions to that effect in his will. By the command of Augustus these directions were disobeyed, and it was published as we now possess it. At his own wish he was buried at Naples, on the road to Pozzuoli, his tomb for many hundred years after being worshiped as a sacred place.

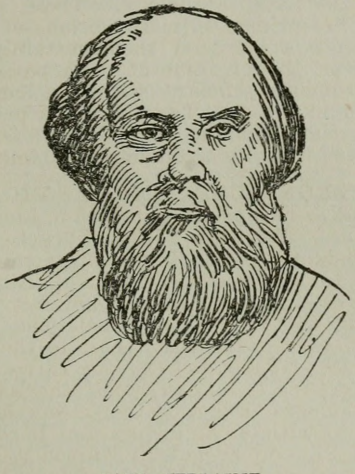
Besides the three works already mentioned, a few juvenile pieces of more or less probable authenticity are extant under his name. These are the "Culex" and the "Moretum," both in hexameter verse, the former an "epyllion," or short poem of narrative and description in the epic manner, the latter an idyll freely translated from the Greek of Parthenius; the "Copa," a short elegiac piece; and 14 little poems in various meters, some serious, others trivial, which come under his name at the head of a collection of minor Latin poetry incorporated in the Latin anthology. These pieces are not printed in most editions of Vergil, nor are any of them certainly authentic, though some of them passed as his among scholars within a century after his death. The "Ciris," a piece of the same kind as the "Culex," is now agreed to be by a contemporary imitator.

VERGNIAUD, PIERRE VICTURNIEN, a French orator; born in Limoges, France, May 31, 1753. Turgot, then intendant of the Limousin, nominated him to a bursarship at the Collége du Plessis at Paris. He studied divinity aimlessly at the Sorbonne, but soon grew tired of it, next took a post in the civil service at Paris, but ere long threw it up and retired to his bankrupt father's house at Limoges. But a brother-in-law helped him to settle as an advocate at Bordeaux in 1781, and he quickly gained a great practice, and was elected a deputy to the National Assembly in 1791. His splendid eloquence, the charm of his personality, made him the leader of the Girondists, but he was too indolent and unambitious to care for political intrigue, and indeed he was far more of the orator than the statesman. Sent to the Convention by the department of the Gironde, he supported, in the question of the king's trial, the proposal of Salle to make an appeal to the people. When the decisive moment came he voted for death, and as president it was his duty to announce the result. In the struggle with the Mountain he made a splendid effort, but too late. He was guillotined Oct. 31, 1793, the last of the 21 who died together.

VERHAEREN, EMILE, a Belgian poet and writer, born in Saint Amand, near Termonde, in 1855; died in Rouen, in train accident, in 1916. Until the out-

break of the World War his fame was largely confined to his native land, where he was popular as a lyric poet and a dramatist. After the German invasion of Belgium he sought refuge in England, after which his works became widely known throughout all the Allied countries and the United States. He has written over forty volumes, mostly lyrical poetry, and four plays, as well as some monographs on painters. One of his best known prose works is "Toute la Flandre," a historical and legendary study of Flanders. Another of his well known works is "Les Aubes."

VERLAINE, PAUL, a French poet; born in Metz, March 30, 1844. He led a life of vagabondage, vibrating between prison and hospital; but was the most potent factor in modern French poetry,



PAUL VERLAINE

He was the real founder and best exponent of the Symbolic School. He wrote: "Saturnine Poems" (1866); "Gay Festivals" (1869); "Accursed Poets" (1884); "Of Old and of Late" (1885). Among his stories are: "Louise Leclercq" (1886); "Memoirs of a Widower" (1887); "Stories Without Words" (1887); "Love" (1888); "Dedications" (1890); "Good Luck" (1891); "My Hospitals" (1891). He died in Paris, Jan. 8, 1896.

VERMEJO, or **RIO GRANDE**, a river of the Argentine Republic, rises in the highlands of Bolivia, and flows in a general S. E. direction till it joins the Paraguay. It is 1,300 miles in length, and has a very tortuous course.

VERMICELLI, an Italian mixture prepared of flour, cheese, yolks of eggs, sugar, and saffron, manufactured in the form of long slender tubes or threads, and so named from their worm-like appearance. Vermicelli differs from macaroni only in being made in smaller tubes. Both are prepared in perfection at Naples, where they are a favorite dish with all classes, and form a principal item in the food of the population. Vermicelli is used in soups, broths, etc.

VERMIFORM APPENDAGE, or **VERMIFORM APPENDIX**, in comparative anatomy, *appendix cæci vermiformis*. So far as is known, this appendage is peculiar to man, certain of the higher apes, and the wombat. The vermiform appendage in the human species hangs from the cæcum, which is the point of junction between the smaller intestines and the ascending colon. In size and shape it resembles a man's little finger. Its lining membrane secretes a mucus which in health constantly wells up into the lower end of the colon where the ileocæcal valve opens, and this mucus acts as a lubricant to the valve. Sometimes the appendix becomes ingested with fæcal matter and serious and even fatal inflammation results. See APPENDICITIS.

VERMIFUGES, VERMICIDES, or **ANTHELMINTICS**, remedies which possess the property of destroying intestinal worms, or of expelling them from the digestive canal. Those in most common use at the present day are: For tapeworms, extract of malefern root, in doses of half to one teaspoonful, and turpentine in doses of one to two tablespoonfuls for round worms, santonin; and for thread worms santonin and saline cathartics by the mouth, but particularly injections by the rectum of common salt, strong green tea, infusion of quassia, or diluted steel drops.

VERMILIA, in zoölogy, a genus of *Serpulidæ*, in which the tortuous shell or sheath is attached to some foreign body by its whole length. Found in the seas of Europe. Fossil from the Lower Oölite onward.

VERMILION (sulphide of mercury, formula, Hg, 87; S, 13); exists in the native state as cinnabar, from which this beautiful red pigment is obtained by selecting pure pieces and simply grinding them. It is, however, generally made artificially. By one dry process the first step is to prepare an intimate mixture of 100 parts of mercury and 18 parts of sulphur, which are agitated together in revolving vessels till they have combined. The powder so obtained is afterward sublimed in specially constructed retorts, and the purest portion condensed on the heads of the retorts is then treated with

a little caustic potash, and washed with warm water. One of several wet processes in use for making vermilion consists in combining mercury and sulphur by grinding them together in the presence of water, caustic potash being afterward added, and the mixture triturated for some hours at a temperature of 113° F. The product is afterward thoroughly washed. The Chinese have long made beautiful vermilion.

VERMONT, a State in the North Atlantic Division of the North American Union; bounded by Quebec, New Hampshire, Massachusetts, and New York; admitted to the Union, March 4, 1791; number of counties, 14; capital, Montpelier; area, 9,564 square miles; pop. (1890) 332,422; (1900) 343,641; (1910) 355,956; (1920) 352,428.

Topography.—The surface of the State is mountainous, being traversed from N. to S. by the Green Mountains, which culminate in Mansfield Mountain in the N. W. with an altitude of 4,300 feet. The State is drained in the E. by the affluents of the Connecticut river, which forms its entire E. boundary line, and in the W. by those rivers entering Lake Champlain, which forms over one-half its W. boundary. The principal rivers are the Passumpsic, Wells, White, Black, West, and Deerfield, flowing into the Connecticut; and Otter Creek, Winooski, Lamoille, and Missisquoi emptying into Lake Champlain. Lake Memphremagog on the Canadian border receives the Clyde and several other small streams. The rivers are not navigable, but afford excellent water power. There are numerous small lakes, the principal ones being Willoughby, Maidstone, Seymour, Dunmore, Austin, and Bombazine. Several large islands in Lakes Champlain and Memphremagog belong to the State, North and South Hero, Isle la Motte, and the peninsula of Alburg, with the former, constituting Grand Isle county.

Geology and Mineralogy.—The principal geological formations are of Azoic and Silurian origin, the entire State being covered with glacial drift. Laurentian deposits occur in the S. W., and Lower Silurian and Primordial rocks occur along Lake Champlain. Old sea beaches, lake and river terraces, and terminal moraines abound in fossils, and make geological research exceedingly interesting. The State is famous for its marbles. They occur in many localities, especially in Bennington and Rutland counties, and are found in many colors. Iron, silver, gold, galena, and zinc occur in small deposits, and other mineral products are amethysts, feldspar, mica, chalcedony, jasper, garnets, tourmaline, and asbestos. The product of the granite quarries is over $5,000,000 annually, slate over $1,000,000, and talc about $500,000. The metal production is of little importance.

Agriculture.—Vermont is a farming State and produces all the cereals, but stock raising and dairy farming are the principal agricultural industries. It is especially noted for its production of maple sugar. The acreage, value and production of the principal crops in 1919 was as follows: corn, 40,000 acres, production 2,120,000 bushels, value $3,710,000; oats, 110,000 acres, production 3,960,000 bushels, value $3,564,000; hay, 910,000 acres, production 1,456,000 tons, value $29,266,000; potatoes, 25,000 acres, production 3,125,000 bushels, value $4,906,000.

Manufactures.—The extensive water power, timber land, and stone quarries of Vermont give it a prominent place among manufacturing States. There were in 1914, 1,772 manufacturing establishments, employing 32,704 wage earners. The capital invested amounted to $79,847,000; the amount paid in wages was $18,617,000; value of materials was $42,706,000; and the value of the finished product $76,991,000. The principal articles of manufacture are lumber and timber, dairying products, marble and granite tombstones and monuments, paper and wood pulp, flour and grist, woolen goods, hosiery and knit goods.

Banking.—On Oct. 31, 1919, there were reported 48 National banks in operation, having $4,935,000 in capital, $4,220,000 in outstanding circulation, and $9,341,000 in United States bonds. There were also 20 mutual savings banks with $110,241,000 savings deposits.

Education.—School attendance is compulsory for children from 6 to 15 years. No children under 16 who have not completed a nine year school course may be employed in railways, factories, mines, or quarries. There were in 1919, 61,059 enrolled pupils in the schools, which numbered 2,472. There were 3,023 teachers. The State has two normal schools. The institutions for higher education are the University of Vermont, Middlebury College, and Norwich University.

Churches.—The strongest denominations in the State are the Roman Catholic; Congregational; Methodist Episcopal; Regular Baptist, North; Presbyterian; Protestant Episcopal; Universalist; Freewill Baptist; and Spiritualist.

Finances.—The total receipts for the fiscal year 1919, amounted to $4,221,582,

and the disbursements to $4,795,598. There was a balance at the end of the year of $507,715. The bonded indebtedness of the State in that year was $741,531.

Railways.—The total railway mileage in 1919 was 1,080. The chief lines are the Boston & Maine, the Central Vermont, and the Rutland railroads.

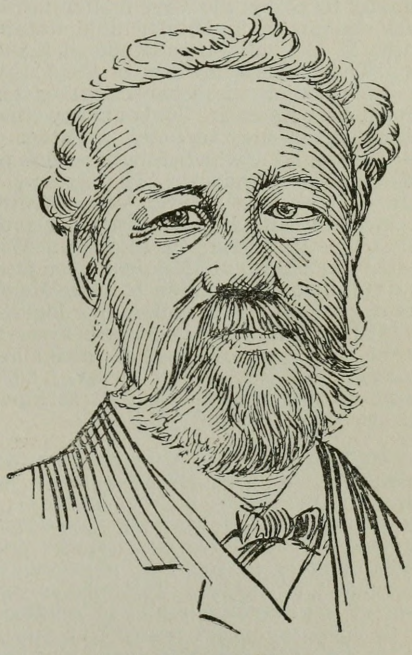
Charities and Corrections.—The institutions under the supervision of the State Board of Charities and Probations include the State Prison at Windsor; House of Correction at Rutland; Industrial School at Vergennes; Soldiers' Home at Bennington; School for Feebleminded; Hospital for the Insane at Waterbury; Sanatorium at Pittsford. There are ten hospitals under the control of the State.

State Government.—The Governor is elected for a term of two years and receives a salary of $3,000 per annum. Legislative sessions are held biennially and are unlimited in length. The Legislature has 30 members in the Senate and 246 in the House, each of whom receives $3.00 per day and mileage. There are 2 Representatives in Congress.

History. — The first settlement by whites was made in 1724 on the site of the present town of Brattleboro. Immigration began to pour in in 1760-1768, during which period the soil had been claimed as part of the New Hampshire grant; whereupon, a counter claim was put forth by the governor of New York, under virtue of the grants from Charles II. to his brother, the Duke of York. On an appeal to the English crown, jurisdiction over the new territory was decided in favor of New York. This was the precursor of an armed strife which continued for 10 years between the New York authorities and the Vermont settlers under the leadership of Ethan Allen and others. This state of things was partially interrupted by the outbreak of the Revolutionary War. In 1777 Vermont declared her independence, and sought admission into the National Confederation. Difficulties intervened, however, and it was not till 1791 that she was admitted into the Union; having previously bought off the claims of New York with the sum of $30,000. Though not at the time a member of the confederated colonies, Vermont had played a distinguished part in the war of independence, and her "Green Mountain Boys" participated in some of the hardest fought battles of the war. In the War of 1812, the Vermonters added fresh laurels to their military record. During the Civil War Vermont furnished more than her quota of men, sending more than one-tenth of the whole population.

VERMONT, UNIVERSITY OF, and State Agricultural College, a coeducational, non-sectarian institution in Burlington, Vt.; founded in 1791; reported at the close of 1919: Professors and instructors, 110; students, 658; number of graduates, 5,500; president (acting), Guy W. Bailey, A. B.

VERNE, JULES, a French novelist; born in Nantes, France, Feb. 8, 1828. He studied law for some time, but afterward began writing short pieces for the stage. In 1863 he published "Five Weeks in a Balloon," and the vein of the marvelous, tinged with a quasi-scientific truthfulness, was worked by him with great success. His more popular works are: "Twenty Thousand Leagues Under the Sea," "From the Earth to the Moon,"



JULES VERNE

"Across Africa in a Balloon," "Michel Strogoff," "To the Center of the Earth," "Round the World in Eighty Days," "The Mysterious Island," etc. Most of his works have been translated. He died at Amiens, March 23, 1905.

VERNER, KARL ADOLPH, a Danish philologist; born in Aarhus, Denmark, March 7, 1846; was educated at the University of Copenhagen. In 1876-1883 he was assistant librarian at Halle Univer-

sity. He was then made Professor of Slavonic Languages at the University of Copenhagen. He was the author of "An Example of the First Permutation of Consonants" (in 1875). This article, which was widely read, had considerable influence. Verner likewise wrote many other articles for linguistic periodicals. He died Nov. 5, 1896.

VERNET, JEAN ÉMILE HORACE, a French painter; grandson of Claude Joseph Vernet, a distinguished painter of sea pieces and seaport scenes; son of Antoine Charles Horace Vernet, painter of battle and genre pictures; born in Paris, France, June 30, 1789. His first master in art was his father, and at an early age he acquired the favor of the imperial court by his battle pieces, in which he adopted a realistic treatment in opposition to the classical school of David. His pictures connected with the wars of Napoleon are very numerous. In 1828 Charles X. appointed him director of the French Academy in Rome, a post he ably filled till the end of 1834, producing a series of pictures, partly historical, partly genre. Louis Philippe then commissioned him to paint galleries of the museum at Versailles with scenes relating to the conquest of Algeria, a country which he several times visited. In 1840 we find him traveling in Egypt, Palestine, and Syria; in 1842 he accompanied the Emperor Nicholas on a journey from St. Petersburg to Sebastopol; and in 1845 he visited Spain and Algeria. In 1853 he followed the French army to Varna, but soon returned to Paris and produced his last great picture, "The Battle of the Alma." He died in Paris, Jan. 17, 1863.

VERNIER (named after the inventor, Peter Vernier, of Brussels, who described it in a tract printed in 1631), a contrivance for measuring fractional portions of one of the equal spaces into which a scale or limb, or a graduated instrument is divided. The vernier consists of a graduated scale, so arranged as to cover an exact number of spaces on the primary scale, or limb, to which it is applied. The vernier is divided into a number of equal parts, greater or less by 1, than the number of spaces which it covers on the limb. The vernier scale is 1 1-10 inches in length, and is divided into 10 equal parts, each embracing 11-100 of an inch, and therefore exceeding each division of the scale by 1-100 of an inch. If, therefore, any division of the vernier coincide with a division on the scale, that division, counting downward, when the 0 of the vernier coincides with the top of the mercurial column, indicates the number of hundredths of an inch to be added to the tenths division on the scale next above which the 0 of the vernier stands.

VERNON, EDWARD, a British naval officer; born in Westminster, England, Nov. 12, 1684; was well educated, and following a strong natural bent, entered the royal navy. He served in the battle of Vigo Bay, Oct. 12, 1702, and with Sir George Rooke at Malaga in 1704, and soon got a captaincy. Made M. P. for Penryn (1727), and for Portsmouth (1734-1741), he boasted in the House of Commons that he could take Porto Bello with six ships. Sent off with the specified number of vessels, he fulfilled his boast, Nov. 22, 1739. In 1741, however, he failed in his attack on Cartagena, but his popularity was undiminished, and he long represented Ipswich in Parliament. Smollett, who acompanied him to Cartagena, has immortalized the expedition in "Roderick Random." In 1746 he was removed from the list of admirals, through a dispute with the admiralty. Vernon published "A New History of Jamaica from the Earliest Account to the Taking of Porto Bello" (1740), and "Original Papers Relating to the Expedition to Panama" (1744). He died in Nacton, Suffolk, Oct. 29, 1757.

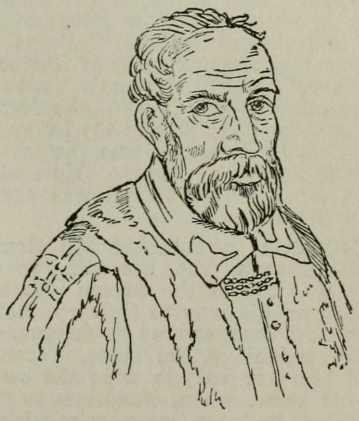
VERONA, an ancient city of northern Italy; capital of the province of the same name; picturesquely situated at the foot of the Tyrolese Alps, and on both banks of the Adige; 72 miles W. by N. of Venice. It is a member of the famous Quadrilateral, having fortifications of unusual strength, and is interesting no less as a great center of historical associations than as a celebrated home of art, rich in classical and mediæval monuments of architecture. The Adige is here crossed by five bridges, and on the tongue of land on the W. side lies by far the greater part of the city. Foremost among the antiquities is the amphitheater, probably erected under Diocletian (A. D. 284), and which brings out in its full perfection the massive grandeur of the true Roman style. It is 106 feet high and 528 yards in circumference, and rises in 45 tiers of gray marble steps, capable of accommodating 25,000 spectators sitting and 70,000 standing. Most of the outside range of arches is lost, but the internal seats have been wonderfully preserved by a custom of repairing them which has gone on unbrokenly through all the ages, and which has become a part of the history of the building. Another antiquity, the great gate of Verona, the Porta de Borsari, now spanning one of the busiest streets, was

erected by Gallienus in A. D. 265. Among the other Roman remains is the Arco dei Leoni. In the architecture of Verona there is a gap extending from the 3d to the 12th century from the amphitheater in the days of Diocletian to the Church of San Zeno in the time of Friedrich Barbarossa. The latter edifice is the great example of what Freeman very aptly calls "the barbaric form of Italian Romanesque." The nave in its present form was begun in 1139, and the choir dates from the 13th century. A notable feature is the great Campanile; the projecting portal rests on lions of red marble, the interior has an open roof supported by fine pillars and columns.

The Cathedral of Santa Maria Matricolare is an imposing Gothic structure of the 14th century. At the portal are Roland and Oliver, the paladins of Karl the Great, and over the altar is a celebrated Assumption by Titian. The little church of St. Stephen on the E. or Theodoric's side of the river at one time disputed with the great Duomo the first place among the churches of Verona, as the seat of her bishops in life, and their resting place in death. Other notable churches are the Gothic S. Anastasia (begun 1261), with marble façade; S. Giorgio in Braida (1604), designed by Sammicheli, and adorned with pictures by Tintoretto, Veronese, etc.; S. Fermo Maggiore, of the 14th century, with rich interior; and S. Nazzaro e Celso, a work of the Renaissance. Verona has many fine palaces, including the Palazzo del Consiglio ("La Loggia"), restored in 1873, with statues of famous Veronese, comprising Cornelius Nepos, Catullus, Vitruvius, the younger Pliny, Æmilius Macer, etc.; and the Palazzo Pompei alla Vittoria, now containing the Civic Museum and valuable picture gallery. A unique Gothic structure is the tomb of the Della Scala family, who were presidents of the republic of Verona for upward of a century. On the left bank of the Adige rises the Castello S. Pietro, the stronghold of Theodoric, which was remodeled by Galeazzo Visconti in 1393, and which, after being dismantled by the French (1801), was refortified by the Austrians in 1849. The adjoining Giardino Giusti is noted for its venerable cypresses, some of which are over 400 years old, and attain a height of 120 feet.

The seat of a bishop, a prefect, a tribunal, a commander-general, etc., Verona has numerous educational and benevolent institutions. There is an important transit trade with Germany, and among the leading manufactures are silks, woolens, cottons, musical instruments, furniture, etc. Verona is one of the oldest towns of Italy, its earliest inhabitants being either the Euganei or the Celtic Cenomani. It became a flourishing colony under the Romans. Here Decius defeated the Emperor Philip in 249, Constantine overthrew the army of Maxentius in 312, and Stilicho hurled back the hosts of Alaric in 403. After his defeat of Odoacer (489) at Verona, Theodoric made it his alternative residence, and it was subsequently called Wälsch-Bern, or Dietrichs-Bern, to distinguish it from "Verona in montibus." The city suffered during the Ghibelline wars, but prospered under the Scaligers (1262-1387), who were succeeded by the Visconti and Carrara families. It escaped the tyranny of hereditary rulers by transferring its allegiance in 1405 to Venice, whose fortunes it subsequently shared. The city was several times bombarded by Austrian airplanes during the World War. Pop. about 75,000.

VERONESE, PAUL (PAOLO), the name by which Paolo Caliari (or Cagliari), an Italian artist of the Venetian school, is usually known, from his having been born at Verona, probably in 1528. A sculptor's son, he studied painting under an uncle, Antonio Badile, and,



PAUL VERONESE

after some work in his native city and Mantua, in 1555 settled in Venice, where he rapidly acquired both wealth and reputation. He had for contemporaries both Titian and Tintoretto, and, though 50 years Titian's junior, was held in equal admiration with these famous painters. The Church of San Sebastiano, in Venice, contains many of his pictures (both frescoes and easel pictures, from the story of Esther, martyrdoms, etc.) which are reckoned the most important of his earlier period—the period before

his visit to Rome (1563), when he first became acquainted with the masterpieces of Raphael and Michæl Angelo. The influence of the Roman school on his style was marked, new dignity, grace of pose and ease of movement being added to his rich Venetian coloring; a specific decorative element is also hereafter more conspicuous. He was kept busy with innumerable commissions, some of which he executed elsewhere than at Venice (as at Vicenza and Treviso). Veronese is remarkable more for the fertility than for the depth or spirituality of his imagination. His design is generally noble, his composition rich, and his execution truthful. In the invention of details, especially, he is inexhaustible, and often overloads his pictures with ornament. One peculiarity of his works is the frequent introduction of splendid architectural backgrounds, which, however, were frequently painted by his brother Benedetto. The most celebrated of his works —many of them very large—is the "Marriage Feast at Cana of Galilee," now in the Louvre at Paris; it is 20 feet high, and 30 in length, and contains 120 figures, many of them portraits of his contemporaries, and the details much more 16th-century than ancient Jewish. Besides these may be mentioned: "The Calling of St. Andrew to the Apostleship," "The Feast of Simon," and (in the National Gallery) the "Presentation of the Family of Darius to Alexander," and "St. Helena's Vision of the Invention of the Cross"—the former purchased for $65,000, and the latter for over $15,000. Veronese was the last of the great Venetian painters. He died in Venice, April 19, 1588, and was buried in San Sebastiano.

VERONICA, a saint of the Roman Catholic Church, who, according to the legend, was one of the women who met our Lord on his way to Calvary. As he was sinking, overpowered by fatigue, under the weight of the cross, Veronica offered him her veil, to wipe the sweat from his brow, when, wondrous to tell, the divine features were miraculously impressed on the cloth, and remained as a permanent picture of the face of our Lord. This miraculous picture is reported to have been preserved in Rome at St. Peter's Church from about the year 700. Another, of similar appearance, is preserved at Milan. Many Catholic writers have supposed that the name Veronica is but founded on an erroneous application of what in reality was meant to designate not the personage, but the picture, which was described as *vera icon*, "the true image" (*i. e.*, of Christ).

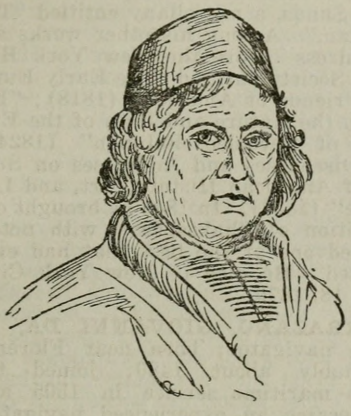
VERPLANCK, GULIAN CROMMELIN, an American author; born in New York City, in 1786. He published anonymously in 1819 a brilliant satirical work, entitled: "The State of Triumvirate." In 1825 he was elected to Congress, and published, 1827-1830, conjointly with William Cullen Bryant and Robert C. Sands, a miscellany entitled "The Talisman." Among his other works are his address before the New York Historical Society entitled "The Early European Friends of America" (1818); "Essays on the Nature and Uses of the Evidences of Revealed Religion" (1824); and "Discourses and Addresses on Subjects of American History, Art, and Literature" (1833). In 1846 he brought out his edition of Shakespeare, with notes, esteemed one of the best that had ever appeared. He died in New York City, March 18, 1870.

VERRAZANO, GIOVANNI DA, an Italian navigator; born near Florence presumably about 1480; joined the French maritime service in 1505 and soon became an experienced navigator. In 1512 he was employed by France as a privateer against Spanish merchantmen and made many captures. In 1523 he took the treasure ship sent by Cortés to Charles V., which contained plunder from Montezuma estimated at $1,500,000 in value. In January, 1524, he made an exploring expedition to North America, and after discovering land near Cape Fear sailed N. and entered either New York or Narragansett Bay. He then sailed 450 miles N. E. and returned to France. On July 8, 1524, he sent a letter to King Francis I., in which he claimed to have discovered 700 leagues of coast. Little is known of his subsequent history. It is supposed that he was taken prisoner off the S. coast of Spain and executed as a pirate in Pico, New Castile, in November, 1527.

VERRES, CAIUS, a Roman governor, notorious for his rapacity and cruelty; born about 112 B. C. He was quæstor in 82, and city prætor at Rome in 74 B. C. He was governor of Sicily in 73-71, and almost ruined that island by his extortions and vexatious measures, and by his plunder of property and art treasures. He was brought to trial and defended by Hortensius, while Cicero conducted the prosecution. The trial was one of the most celebrated in the history of Rome. Verres absconded before his trial ended and fled to Marseilles, where he remained in exile 27 years. He died about 42 B. C.

VERROCCHIO, ANDREA DEL, an Italian sculptor and painter; born in Florence, Italy in 1435. First a gold-

smith, he became a sculptor almost equally skilled in working marble and bronze. Only one extant picture can be certainly attributed to him, a "Baptism of Christ" in the Florentine Academy, and in this, according to Vasari, an angel's head was by Leonardo da Vinci. Of



ANDREA DEL VERROCCHIO

his bronze statues the "David" and the "Unbelieving Thomas" in Florence, and the great equestrian statue of Bartolommeo Colleoni at Venice, are among the most notable. He died in Venice in 1488.

VERSAILLES, a city of France; capital of the department of Seine-et-Oise; on a plain 11 miles S. W. of Paris. A city more of pleasure than of industry, long accustomed to find its sustenance in the expenditures of a luxurious court, and subsequently a place of residence for many foreigners, attracted there by the salubrity of the climate, the fine promenades, and the economy of living, as compared with that in Paris, it has few manufactures and little trade. The town covers a large area in proportion to its population, and is of remarkably regular construction, consisting of long and straight streets, crossing at right angles. It is the see of a bishop, and contains a public library of 50,000 volumes, many palatial edifices, public fountains, spacious squares, and elm-planted avenues. The great attraction of Versailles is its palace, and the history of this structure may be said to be the history of the town. Louis XIII. built a hunting lodge here, afterward extended into a château. The site occupied by the palace is known to have been that of the ancient priory of St. Julien. Louis XIV. devoted enormous sums to its embellishment, or rather reconstruction, under the care of Mansard; and Louis XV., altered the arrangement of the interior. Here was signed in 1783 the peace of Versailles between England and the United States. Under Louis XVI. Versailles continued to be one of the usual residences of the court down to the period of the Revolution, which great event had its beginning here in the meeting of the States-General in May, 1789. At this date the population was 100,000; the palace and its park, the perfection of formal landscape gardening, have been the model of many capitals. Louis Philippe transformed the palace of Louis XIV. into a museum, to contain trophies of the victories of France. The approach to the palace is by the Place d'Armes and the Cour d' Honneur, in the latter of which are a large equestrian figure of Louis XIV. and other statues. The entire length of the palace is nearly 1,400 feet. The collections embrace pictures of events in French history, portraits of French heroes, etc. The most interesting are the pictures by David which illustrate the career of Napoleon, those by Horace Vernet, and some by Ary Scheffer and Delacroix. The gardens, with their broad terraces and long alleys, are imposing, but formal; the fountains are on the grandest scale. From the middle of September, 1870, till the conclusion of peace in 1871 Versailles was the center of all the operations of the Germans. On September 20 King William and the Crown Prince entered the town; and there, on Jan. 18, 1871, the former was proclaimed Emperor of Germany. On Jan. 28 the capitulation of Paris was signed in Versailles; after the peace it was the seat of the National Assembly and government till 1879, and headquarters of the army during the Commune. The Treaty of Peace which ended the World War was negotiated and signed at Versailles. See PEACE TREATY. Pop. about 60,000.

VERSE, a measured and cadenced form of speech or composition, usually adopted in poetry. It seems to be the natural language of passion, yet it has unquestionably been improved and developed by art. The use of rhymed cadences is a comparatively modern invention. Grammarians have elaborately classified the varieties of verse, and analytically distinguished the possible divisions of words into bars of accented and unaccented syllables. The term is also applied to a line of poetry consisting of a certain number of metrical feet disposed according to the rules of the species of poetry which the author intends to compose. Verses are of various kinds, as hexameter, pentameter, etc. Blank verse is verse in which the lines do not end in rhymes. Heroic verse is rhymed verse in which the lines usually consist

of 10 syllables, or in English in five accented syllables, constituting five feet.

VERST, a Russian measure of length, equal to 3,500 English feet, or very nearly two-thirds of a mile.

VERTEBRA, in comparative anatomy, one of the bony segments of which the spine, or backbone, consists. Theoretically, a typical vertebra consists of a central piece or body, from which two arches are given off, one (the neural), protecting the nervous system, the other (the hæmal) protecting the organs of circulation, and thus corresponding to the doubly tubular structure of the body of the Vertebra. In practice the second arch is only recognizable with difficulty, the parts being either absent or much modified, but a good example may be seen in the human thorax. The fundamental element of each vertebra is the body or centrum, from the surface of which spring two bony arches, called the neural arches, or neurapophyses, because they form with the body the neural canal, which incloses the spinal cord. From the point of junction there is usually developed a spine, called the spinous process, or neural spine, rudimentary in the atlas or first cervical vertebra. From the neural arches are also developed the articular process or zygapophyses, which aid the centra in uniting the vertebræ to each other. From the sides of the body proceed the transverse processes. The number of vertebræ varies greatly in different animals. The vertebral column is divisible into distinct regions, of which the following are recognizable in the higher Vertebrata: The cervical vertebræ (seven in man), composing the neck; the dorsal (twelve in man), usually carrying well-developed ribs; the lumbar (five in man). These form the cervical, dorsal and lumbar regions respectively, and are sometimes called true vertebræ, to distinguish them from the false vertebræ, which consists of those in the sacral region usually anchylosed to form a single bone, the os sacrum, and a variable number of vertebræ forming the caudal region or tail. The spaces between the vertebræ are filled with an elastic substance, admitting of an amount of motion which, though slight between each pair, is in the aggregate sufficient to give the spinal column considerable flexibility. The vertebræ and their projections or processes afford attachments for a number of muscles and ligaments, and passages of blood vessels and for the nerves passing out of the spinal cord.

VERTEBRATA, in zoölogy, a division of the animal kingdom, instituted by Lamarck, comprising animals in which the body is composed of a number of definite segments, arranged along a longitudinal axis; the nervous system is in its main masses dorsal, and the neural and hæmal regions of the body are always completely separated by a partition; the limbs are never more than four in number; generally there is a bony axis known as the spine or vertebral column, and a notochord is always present in the embryo, though it may not persist in adult life. A specialized hæmal system is present in all, and in all but *Amphioxus* there is a heart with never less than two chambers, and in the higher vertebrates with four. The vertebrata are usually divided into five classes: Pisces, Amphibia, Reptilia, Aves and Mammalia, and many attempts have been made to gather these classes into groups. One plan is to divide them into branchiata (fishes and amphibians), because at some portion of their life they are provided with gills, and abranchiata (reptiles, birds and mammals), having no gills. The latter are sometimes called amniota or allantoidea, because the embryo is provided with an ammon and an allantois, while both these are absent in the branchiata, which are therefore called anamniota or anallantoidea. Owen made two sections: Hæmatocrya, or cold-blooded vertebrates (fishes, amphibia and reptiles), and Hæmatotherma, or warm-blooded vertebrates (birds and mammals); and Huxley three: Ichthyopsida (fishes and amphibia), sauropsida (reptiles and birds), and mammalia. A later classification is to treat all the vertebrata as a division of a larger group, Chordata, distinguished by (1) temporary or permanent possession of a rod (the notochord) underlying the central dorsally-placed nervous system; and (2) the temporary or permanent presence of visceral clefts. The Chordata are divided into three groups: (1) cephalochordata, in which the notochord, pointed at the extremities, extends from one end of the body to the other; (2) urochordata, and (3) the true vertebrata, or craniata, in which the anterior end of the central nervous system is enlarged into a brain, and which becomes surrounded and protected by a cartilaginous capsule or skull.

VERTUE, GEORGE, an English engraver, born in Westminster, in 1684. He enjoyed the patronage of Sir Godfrey Kneller, and became engraver to the Society of Antiquaries in 1717. His best known works include 12 portraits of poets and 10 portraits of Charles I. and his friends. He died in London, July 24, 1756.

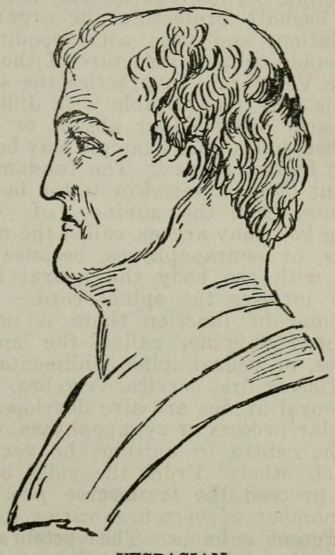
VERTUMNUS, a Roman deity who presided over crops and orchards. He is generally represented as a young man crowned with flowers, and holding in his right hand fruit, and a horn of plenty in his left. He was the husband of Pomona.

VERVIERS, a town of Belgium; in the province of Liège, on the Vesdre, 14 miles E. S. E. of Liège. It is celebrated for its manufacture of broadcloth, which is the staple of the town. There are also cotton, leather and other manufactures. The Germans first entered Belgium in 1914 through this city. Pop. about 50,000.

VERY, JONES, an American poet; born in Salem, Mass., Aug 28, 1813; published some essays and poems in 1839, and was a contributor to the "Christian Register," a monthly religious magazine, and other journals. A complete edition of his "Essays and Poems," with a biographical note of the author, was published by James Freeman Clark, Boston, 1886. He died in Salem, May 8, 1880.

VESALIUS, ANDREAS, a Belgian anatomist; father of modern anatomy; born in Brussels, Belgium, Dec. 31, 1514. In 1544 he was appointed chief physician to the Emperor Charles V., and on his abdication in 1555 he was nominated to the same office by his son, Philip II. His opposition to the Galenic doctrines, his habit of dissecting human bodies, then considered impious, and the great reputation he enjoyed at the Spanish court, raised him many enemies; and a rumor that he had opened the body of a young Spanish nobleman whose heart showed symptoms of vitality, having got abroad, he was publicly accused of murder. The charge was taken up by the clergy and the medical faculty, to whom he was obnoxious, and also by the relations of the deceased; and though he enjoyed the protection of the king, he was obliged to flee from the persecution by which he was assailed, and to travel into Palestine by way of expiation of his alleged guilt. On his return he was shipwrecked on the island of Zante, where he perished miserably of cold and hunger, Oct. 15, 1564. He was the author of numerous works, but that by which he is best known is entitled "The Structure of the Human Body."

VESPASIAN, TITUS FLAVIUS VESPASIANUS, a Roman emperor; born of a poor family in the country of the Sabines A. D. 9. He served in the Roman armies, gradually rising to distinction, and in 66 was charged by Nero with the conduct of the Jewish war. He was still engaged in it when Nero died, and while the civil war was going on between Otho and Vitellius, Vespasian was proclaimed emperor, A. D. 69. He returned to Italy, leaving the war to his son Titus, and applied himself to the re-establishment of order, and the improvement of the administration. He contented himself with the outward life of a private citizen, and contributed the force of his own example toward the introduction of a simpler mode of life,



VESPASIAN

and purer morals. The Jewish war ended in 70, and the next year Vespasian and Titus had a joint triumph. Vespasian died, A. D. 79, leaving two sons, Titus and Domitianus, who both became emperors.

VESPERS, so called from Vesper, the evening star, was also called *hora lucerna* ("lamp hour"). Originally, like that of all the canonical hours, of which at first it was the last, the service consisted of the singing of three psalms intermixed with some prayers. According to the account of all the services given in the Apostolic Constitutions, that for vespers opened with the 140th (141st) Psalm, which was followed by a prayer. A collect was next said by the bishop, and a benediction pronounced on the people, who were then dismissed. But different churches had different usages, and in some lessons were read, hymns sung, and other prayers offered.

VESPUCCI, AMERIGO, or **AMERICUS VESPUCIUS**, an Italian navigator,

eponymus of the New World; born in Florence, Italy, March 9, 1451. The question of the date of his voyage has been disputed for centuries. According to one account he reached South America in June, 1497, or 14 months earlier than its discovery by Columbus. His "Letters" (1502), giving an account of his voyages, especially of the voyage of 1501, were translated into Latin, Italian, French, and German, and were widely circulated. He wrote a diary called "The Four Journals," after his fourth voyage.



AMERIGO VESPUCCI

The suggestion to name the newly discovered continent "America" was first offered by Martin Waldseemüller of St. Dié in Lorraine, in his work "Introduction to Cosmography" (1507). He died at Seville, Spain, Feb. 22, 1512.

VEST, GEORGE GRAHAM, an American lawyer; born in Frankfort, Ky., Dec. 6, 1830; was graduated at Center College, Ky., in 1848, and at the Law Department of Transylvania University, Ky., in 1853; settled in Missouri in the latter year and there began the practice of law; was a member of the Confederate Congress for three years; and was elected to the United States Senate from 1879 to just before his death in 1904.

VESTA, an ancient goddess, called Hestia by the Greeks. According to the traditions of that people she was a virgin divinity, and watched over the fire that burned on the household hearth, which was looked on as her shrine. Something sacred attached to this part of the house. It was the family altar; here suppliants took refuge; on it oaths were sworn. Each town had its public fire, which was left continually burning in the Prytaneum; and when a band of colonists went forth from the city, they carried fire lighted at the common hearth with them. At Rome it was believed that Æneas had brought in this manner the sacred fire from Troy. It was preserved in a temple of circular shape with vaulted roof, which stood on the Forum. The sacred fire therein was tended by six priestesses who were called Vestales. They were virgins like the goddess whom they served. They performed several important functions in the State religion of Rome. They assisted at all great public rites, and were present at such religious transactions as the consecration of temples. Their fixed term of service was 30 years, of which they passed 10 in a state of novitiate, 10 in performing the sacred duties of their office, and 10 in instructing novices. After this they were permitted to return to ordinary life if they pleased, though this was a privilege of which few availed themselves; for notwithstanding the drawbacks and restrictions of their position, it was one of great honor and even profit. Lictors preceded them when they appeared in public; consuls and prætors saluted and made way for them. They were maintained at the public expense, and they occupied special places of honor at the public games. If any proved unfaithful to her vows, she met with a terrible fate. She was degraded and deprived of her insignia of office. She was then dressed like a corpse, placed in a close litter, and conducted with all the usual ceremonies attendant on a funeral to a piece of ground called the Campus Sceleratus, where she was buried alive. If the sacred fire of the goddess was allowed through negligence to go out, it was rekindled by the Pontifex Maximus by the friction of two pieces of wood against each other. The festival of Vesta was celebrated on June 9, in each year, on June 15 the temple was cleaned and purified, and on March 1, the sacred fire and the laurel tree that shaded it were renewed.

VESTA, in astronomy, the name of the fourth asteroid, discovered by Olbers at Bremen, March 29, 1807, his second and last discovery among the asteroids. It is the brightest among the small planets, sometimes being visible to the naked eye. After its discovery no more were found till the discovery of Astræa in 1845, more than 38 years later.

VESTMENTS, SACRED. The use by the priesthood of a distinctive costume in public worship formed a part not only of the Jewish, but of almost all the ancient religions. Generally speaking, in

the Christian church the sacred vestments represent the original costume of Rome and the East in the first centuries, retained unaltered by the clergy, whereas in the everyday world the costume varied in fashion, in material, in color from year to year. There seems little room for doubting that from a very early time Christian ministers employed some distinctive dress in public worship; and Catholic writers even find traces in the beginning of the 5th century of the practices of blessing the vestments which were destined for the public services of the Church. The vestments used in the celebration of mass by priests of the Roman Catholic Church are the amice (originally worn over the head); the alb; the girdle, a linen cord tied round the waist, and confining the folds of the alb; the maniple, a narrow strip of embroidered silk, worn pendent from the arm; the stole, and the chasuble. The three last named are always of the same material and color; but this color, which appears primitively to have been in all cases white, now, and for many centuries, varies according to seasons and festivals, five different colors being employed in the cycle of ecclesiastical services—viz., white, red, green, violet, and black. Cloth of gold, however, may be substituted for any of these except the last. Bishops, in celebrating, wear, besides the vestments of priests, two inner vestments, the dalmatic and tunic (those of the deacon and sub-deacon respectively), as also embroidered gloves and shoes, or buskins, together with the distinctive episcopal ornaments—the pectoral cross, ring, miter, and pastoral staff, or, if archbishops, the crozier. Archbishops celebrating mass also wear the pallium. Bishops, when they celebrate pontifically, take their vestments from the altar, whereas priests put them on in the sacristy; but this is a late distinction. In other public services priests and bishops wear the cope, with a pendent cape or hood. In the ministration of the other sacraments, and also in administering communion privately, priests wear the surplice with the stole, or it may even be the stole alone. In the Greek Church the *stoicharion, zoné, epitrachelion, epimanikia* (a square piece of cloth, stiffened, worn pendent from the girdle, and perhaps originally a napkin), and ample *phelonion* correspond respectively with the alb, girdle, stole, maniple, and chasuble. Greek bishops wear the *omophorion*, which corresponds with the later pallium, and also a pectoral cross, and carry a short pastoral staff; but they wear no ring, and, except by the patriarch of Alexandria, the miter is not worn in the sanctuary.

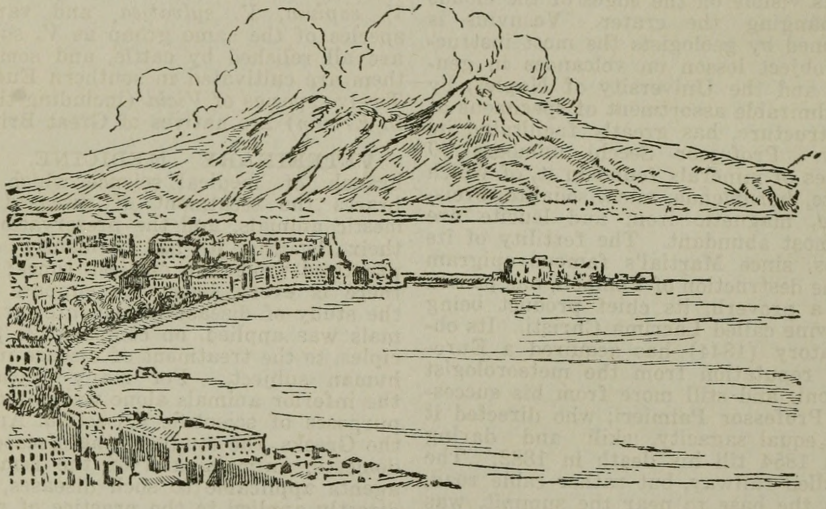
The natural effect of the religious changes of the 16th century was to put aside the costume at the same time and on the same grounds with the ceremonies of the existing worship. This was done, however, by the different churches of the Reformers in very various degrees. The Calvinistic worship may be said to have dispensed with vestments altogether. The Lutherans generally retained with the cassock the alb, and in some countries the chasuble. In the Swedish Church full vestments are retained. In the English Church a variety of practice has existed. As to the rest of the costume, the first Prayer-book retained the Roman vestments with little change; and as the vestments and ornaments of 1549 were again enjoined in 1559, a so-called ritualistic movement in the English Church has since 1851 reintroduced in some places almost every detail of the Roman costume in the communion and other services, a revival which has in many instances been vigorously resisted.

VESTRIS, LUCIA ELIZABETH, an English actress; the granddaughter of Bartolozzi, the engraver; born in London, January, 1797. Accomplished in music, French, and Italian, she married at 16 Armand Vestris, ballet-dancer, member of an originally Florentine family that gave to France a series of distinguished cooks, actors, and ballet-dancers. Three years later she separated from her husband and went on the stage in Paris (1815), attaining fair success. In 1820 she appeared at Drury Lane, London, soon became famous in "The Haunted Tower," was even more popular as Phœbe in "Paul Pry," and in light comedy and burlesque was uniformly successful. She was lessee of the Olympic when in 1838 she married Charles James Mathews, and she afterward undertook the management of Covent Garden and the Lyceum. She retired in 1854, and died in Gore Lodge, Fulham, England, Aug. 8, 1856.

VESTRY, a room adjoining a church where the vestments of the clergy are kept. Hence the place of meeting of those having the charge of parochial affairs, and collectively the persons themselves to whom these affairs are intrusted. In England, the minister, church wardens, and chief men of a parish generally constitute a vestry, and the minister, whether rector, vicar, or perpetual curate, is ex-officio chairman. The powers of the vestry include the expenditure of the parish funds, the repairing or alteration of churches or chapels, and the appointing of certain parish officers. In London the vestries

are highly important bodies. In the Protestant Episcopal Church in the United States a committee is chosen annually by the parish, who, in conjunction with the church wardens, manage its temporal concerns.

VESUVIUS, a volcanic mountain in the Bay of Naples; supposed to have been heaved up from the submarine level where it was formed. Besides the shells which indicate its sea origin, it contains erratic blocks of limestone from the higher Apennine offshoot, Monte Somma, which, in an irregular semicircle, surrounds it on the N. and E. The latter was the seat of volcanic activity long before Vesuvius, which first (A. D. 63) became convulsed by earthquakes, repeated at intervals till 79, in which year occurred its earliest known eruption.



MOUNT VESUVIUS

This was followed by others, of which the more memorable are that in 472, when its ashes alighted in Constantinople; in 512, when they were wafted to Tripoli; in 1036; and in 1500; after which ensued a period of inaction, broken in December, 1631, by a destructive outbreak which denuded the mountain of the forest growth with which it had become clothed. The 18th century witnessed many of its eruptions, the most remarkable being that of 1793, when a lava stream 12 to 40 feet thick swept over Torre del Greco and penetrated the sea to a distance of 380 feet, by which time its volume was 1,204 feet wide and 15 feet high. This stream was so liquid that to leave the crater and enter the sea—a journey of 4 miles—took only six hours.

Another memorable outbreak was that of 1822, when the so-called "smoke" from the crater rose to a height of 10,000 feet, emitting flashes of lightning, raining torrents of hot water, and flooding the villages of S. Sebastiano and Massa. In 1855 occurred a terrible eruption, in which the summit of the cone discharged a lava stream which ravaged the fertile and highly cultivated region below. On Dec. 8, 1861, Torre del Greco suffered severely from another visitation, surpassed in turn by that of 1871-1872, when the sudden emission of lava from a crater of 1855 killed 20 spectators on the spot. S. Sebastiano and Massa were again greatly damaged, the cone threw up fragments of rock to a height of 4,000 feet, and the explosions were so loud that the whole countryside fled panic stricken to Naples. Another outbreak occurred in April, 1906, and endangered several villages with lava streams. From the observations of many years the following characteristics of the volcanic activity of Vesuvius have been summarized by Professor Palmieri: (1) The filling up of the crater portends an imminent eruption, and its full discharge is followed by a period of repose. (2) The narrowing of the mouth of the crater by accumulated debris impedes the flow of the lava, and this impediment leads to the outburst of lateral openings which from their greater proximity to the source of heat emit the lava in a more liquid condition, whereby its flow becomes that of a continuous stream. (3) When the internal channel is blocked by solid débris, the effort of the elastic vapor to

clear it is supposed to cause the earthquakes by which the greater eruptions are preceded and accompanied. (4) What is called "smoke" from the crater is simply steam more or less blackened with incinerated dust. When the dust is in excess it accelerates the fall of the steam, which, having become water by condensation, descends like a mud torrent, flooding the ground. This was a notable feature of the visitation in which Pompeii perished. (5) During an eruption what appears as flame shooting out of the crater is really the reflection of the molten lava within the crater on the steam and upon the ashes suspended in the steam accumulated above it. (6) The rapid condensing of vapor into water, and the conversion of this into steam, generates electricity, which explains the lightning-effects visible on the edges of the clouds overhanging the crater. Vesuvius is reckoned by geologists the most instructive object lesson on volcanoes in general, and the University of Naples, by an admirable assortment of specimens of its structure, has greatly facilitated its study. Professor Secchi numbers 40 species of minerals found in it, of which augite, hornblende, mica, sodalite, breislakite, magnetic iron, and leucite are the most abundant. The fertility of its slopes, since Martial's famous epigram on the destruction of Pompeii, has passed into a proverb, its chief product being the wine called Lacrima Christi. Its observatory (1844) has acquired a European reputation from the meteorologist Melloni, and still more from his successor, Professor Palmieri, who directed it with equal sagacity, skill and daring from 1854 till his death in 1882. The so-called railway, but rather cable road, from the base to near the summit, was opened in 1880. See POMPEII.

VESZPREM (German, Weissbrunn), a town of Hungary, at the N. end of Platten See; 22 miles W. of Stuhlweissenburg. It has a cathedral, a magnificent building of the 14th century, the episcopal palace with the chapel of Queen Gisela, a gymnasium, a college of the Piarist monks, and a tall minaret—the only relic of Turkish occupation. Breweries, corn mills, flannel weaving, spinning, and iron works are the chief industries. The vine is cultivated. Veszprem, which under the Romans had the name of Cimbriana, was once a royal residence. The Hungarians took it in 1491, the Turks in 1552, and it was joined to the empire in 1683. Pop. about 15,000.

VETCH, FETCH, FITCH, or **TARE,** terms variously used to indicate the fodder plant, *Vicia sativa* and the genus *Vicia*. This genus, belonging to the *Papilionaceæ*, sub-order of *Leguminosæ*, consists of about 100 species of climbing or diffuse herbs, distributed through temperate regions of the Northern Hemisphere and South America. The common bean is frequently classed under *Vicia* as *V. Faba*. The next most important species is the vetch, or tare of agriculturists—the *V. sativa* above mentioned. It is one of the best fodder plants, but is only of one or two years' duration; it is important also for green manure, and as a companion crop with clovers. The practice of sowing it along with oats or barley is strongly recommended, insuring a greater bulk of produce, and preventing the crop from massing and rotting in wet weather. *V. Cracca*, or the tufted vetch, *V. peregrina*, *V. sepium*, *V. sylvatica*, and various species of the same group as *V. sativa*, are all relished by cattle, and some of them are cultivated in southern Europe. Twelve species of *Vicia* (including therein *Ervum*) are natives of Great Britain.

VETERINARY MEDICINE, that branch of medical science which embraces the treatment of diseased domestic animals, and the preservation of their health. It has evidently been practiced from the earliest times; and there is every reason to suppose that the study of disease in the inferior animals was applied, on comparative principles, to the treatment of disease in the human subject. For many centuries, the inferior animals alone were used for purposes of scientific dissection. Among the Greeks, the study of the diseases of domestic animals, and of the remedial agents applicable to such diseases, was directly applied to the practice of medicine, and it was compulsory on anyone making a new discovery regarding such curative agents, to divulge it for the public good. Physicians were presumed to be acquainted with veterinary medicine, and Hippocrates, the most celebrated physician of early times, wrote a treatise on the curative treatment of horses. Columella and Vegetius, Latin authors, the latter of whom flourished about A. D. 300, wrote books on the subject, which contain an epitome of the best of all that was previously known. In the Middle Ages, however, veterinary medicine was utterly neglected, and desolating plagues swept away nearly the entire herds and flocks of the countries they visited, precisely as the great epidemics of the Middle Ages swept away vast numbers of human beings, almost depopulating many of the provinces of Europe. Indeed, cattle

plagues were not infrequently the forerunners of great epidemics, and though they may have had no connection as cause and effect, they may have had some co-relation, as affecting the food supplies of human beings and ushering in periods of famine, which would give intensity to epidemic diseases.

During the 16th century veterinary medicine became again a subject of study, and the Constantine collection of works were translated from the original Greek into Latin by the order of François I., and from the Latin they were soon afterward translated into Italian, French and German. During the 17th century, the more important works which appeared were Fiarchi's Italian treatise on "Horsemanship," and the "Infermita e Suoi Remedii, del Signor Carlo Ruini," published in Venice, in 1618. In 1654 the "Grand Marêschal François" was published; and, toward the close of the century, the elaborate work of Sollysel. In Great Britain, Blundeville and Gervase Markham published works on farriery; and Snape, farrier to Charles II., published an anatomical treatise on the horse, his plates being copied from those of Ruini. The 18th century produced numerous authors on veterinary medicine, more especially in France, an impetus having been given to the study by the establishment in 1761, under royal patronage, of the Veterinary Seminary at Lyon under Professor Bourgelat. In 1766 another school was opened at Alfort, near Charenton; and others were subsequently opened at Strassburg and Montpelier, and in almost every European city of note, as Vienna, Dresden, Leipsic, Berlin, Copenhagen, Prague, Munich, Hanover, Naples, London, etc. In 1754 La Fosse, a contemporary of Bourgelat, published his numerous memoirs in one volume, which was soon afterward translated into most of the European languages.

The most celebrated French writers of the beginning of the 19th century were Chabert, Flandrin, Gilbert, Vicq-d'-Azyr, and Huzard. In the reign of George I., Sollysel's work was translated from the French into English by Sir William Hope; and about the middle of the 18th century, Gibson who was formerly surgeon to a regiment of cavalry published his treatise on farriery, the best which had then appeared in the English language. The other writers of this period are Bracken, Bartlet, and Osmer, who had been educated as medical practitioners.

In 1791 the Veterinary College of London was instituted under the presidency of the Duke of Northumberland. In Queen Victoria's reign a charter was granted to the veterinary body at large, forming a Royal College of Veterinary Surgeons, empowered to examine candidates and grant diplomas. In 1819 the first course of lectures on the subject in Scotland was delivered by Mr. Dick, and a systematic course under the auspices of the Highland and Agricultural Society and the Senatus Academicus of Edinburgh in 1823. At his death, in 1866, Mr. Dick bequeathed to the city of Edinburgh his entire fortune, to be devoted to the teaching and improvement of veterinary medicine. In 1857 Mr. John Gamgee established a new veterinary college in Edinburgh; and since 1861 a veterinary school has been conducted in Glasgow by James McCall. In the United States there are some 22 schools of veterinary medicine, with about 400 instructors and over 3,000 students. Most of these are connected with well-known colleges and universities.

VETO, the power which one branch of the Legislature of a State has to negative the resolutions of another branch; or the right of the executive branch of government, such as king, president, or governor, to reject the bills, measures, or resolutions proposed by the Legislature. In Great Britain the power of the crown is confined to a veto, a right of rejecting and not resolving, and even this right is rarely exercised, the last occasion being in 1707.

In the United States the President may veto all measures passed by Congress, but after that right has been exercised the rejected bill may become law by being passed by two-thirds of each of the Houses of Congress. If the President fails to return the bill in 10 days, Sundays excepted, it becomes a law as if he had signed it. If, however, Congress adjourns within 10 days after the passage of a bill and the President has refrained from acting on the bill, it does not become a law; the disposal of a bill in this way, when the President does not choose to veto it formally, is termed a "pocket veto." The earlier Presidents seldom exercised the veto power. Up to Jackson's administration it had been used but nine times—twice by Washington, six times by Madison and once by Monroe. Jackson vetoed nine bills. Up to Johnson's administration no bill had been passed over a veto; but then a large majority in each House was opposed to the President's policy, and the bills which he vetoed were usually repassed by the necessary two-thirds vote and became laws in spite of him. President Hayes sent to Congress a large

number of vetoes, including those of a bill to restrict Chinese immigration and several appropriation bills with riders attached. President Cleveland vetoed a larger number of bills than all the previous Presidents collectively, but the greater number of these were private pension bills.

VEUILLOT, LOUIS (vuh-yō′), a French journalist; born in Boynes, (Loiret), Oct. 11, 1813. His works include: "Pilgrimages in Switzerland" (1839); "Rome and Loretto" (1841); "The Virtuous Woman" (1844); "The French in Algeria" (1845); "Free-Thinkers" (1848); "Vindex the Slave" (1849); "The Day after the Victory" (1850); "The Droit du Seigneur in the Middle Ages" (1854); "The Perfume of Rome" (1861); "The Odors of Paris" (1866); "Paris during the Two Sieges" (1871); "Molière and Bourdaloue" (1877); "Poetic Works" (1878); etc. He died in Paris, April 7, 1883.

VEVAY, or **VEVEY**, a Swiss town in the canton of Vaud; a favorite health resort; remarkable for the beauty of its situation on the N. shore of the Lake of Geneva; 11 miles E. of Lausanne. It stands at the mouth of the gorge of the Veveyse. From the elevations about the town the fine view to the E. commands the valley of the Rhone, backed by the magnificent ramparts of the Alps of Valais. In the Church of St. Martin (date 1498) Ludlow, one of Charles I.'s judges, and Broughton, who read to him his sentence of death, are buried. There is some trade in milk, cheese, and wine; and Vevay cigars are largely made and exported. Pop. about 16,000.

VIADUCT, a term applied to extended constructions of arches or other artificial works to support a roadway, and thus distinguished from aqueducts, which are similar constructions to support waterways. This term became familiar during the 19th century, in consequence of the great number of vast structures so designated which were erected in various parts of the civilized world for the purpose of carrying railways or roadways over valleys and districts of low levels, or above surface roads, and the general name of viaduct is now recognized as applicable to all elevated roadways for which artificial constructions of timber, iron, bricks, or stonework are established; and accordingly among the principal railway works are to be enumerated viaducts of all these materials.

VIARDOT-GARCIA, MICHELLE PAULINE, a French operatic singer; born in Paris, July 18, 1821; daughter of Manuel Garcia and younger sister of Madame Malibran. She was a pupil of Liszt. She appeared as Desdomona in London in 1839, and proving herself a worthy successor to her great sister, soon obtained a European reputation. In 1840 she married Louis Viardot, director of the Italian Opera in Paris. Perhaps her greatest successes were in Meyerbeer's operas, "The Huguenots" and "The Prophet," as Valentine in the former and as Fides in the latter. Her splendid voice had a compass of three octaves, and she shone in the concert room, particularly in the rendering of Spanish songs, as conspiciously as on the stage. She died in 1910.

VIAREGGIO, an Italian town on a beautiful site on the Mediterranean coast; 15 miles N. W. of Pisa. Malarious swamps have been drained, and great pine woods shelter a health resort. Here Shelly's body was cast ashore. Pop. about 12,500.

VIATICUM, among the ancient Romans, an allowance made to soldiers, and to all persons traveling on business of state. In the Roman Catholic Church the viaticum is the Eucharist administered to dying persons. The priest is ordered to bring the sacred elements from the church to the dying person at any hour, whether by day or by night, when he may be called on for this last service of religion.

VIAUD, LOUIS MARIE JULIEN. See LOTI, PIERRE.

VIBORG, one of the oldest cities in Denmark, and capital of a district of Jutland; stands on a small lake, 28 miles W. of Randers. Its 12th-century cathedral was rebuilt in 1726. Pop. about 10,000.

VIBORG, or **VÜPURI**, a city of Finland, on the Gulf of Finland, and at the mouth of the Saima canal, about 75 miles northwest of Petrograd. It has a 13th century castle, a museum, and a school of navigation. The city has important sawmills, and does a large trade in lumber and dairy products, paper, and iron products. Pop. about 30,000.

VIBURNUM, a genus of plants of the natural order *Caprifoliaceæ*, having a five-toothed calyx, a five-lobed, wheel-shaped, bell-shaped, or tubular corolla, five stamens, three sessile stigmas, and a one-seeded berry. The species are shrubs with simple leaves, natives chiefly of the N. parts of the world. *V. opulus* is the guelder rose, or snowball tree, and *V. tinus* is the laurustinus, both well-known ornamental shrubs. *V. lantana*, sometimes called the wayfaring tree, is

a native of the warmer temperate parts of Europe and Asia, not infrequent in England, and often planted as an ornamental shrub. It is a large shrub or low tree, with large elliptic serrated leaves, downy star-like hairs on the under side. The young shoots are very downy. The flowers are small and white, in large dense cymes; the berries purplish black, mealy and mucilaginous, with a peculiar sweetish taste. They are useful in diarrhœa and catarrh, and are used in Switzerland in the manufacture of ink. Bird lime is made from the bark of the roots in the S. of Europe, but is inferior to that made from the bark of the holly. The inner bark is very acrid, and was formerly used as a vesicant. The wood is white and hard, and is prized by turners. Tubes for tobacco pipes are made of the young shoots. Two North American species, *V. pauciflorum* and *V. opulus*, nearly allied to the guelder rose, produce berries of an agreeable acid taste which are used like cranberries.

VICAR, in English canon law, the priest of a parish, the predial tithes of which are impropriated or appropriated, that is, belong to a chapter or religious house, or to a layman who receives them and allows the vicar only the smaller tithes or a salary.

VICAR-APOSTOLIC, in the Roman Church, a name formerly given to a bishop or archbishop, generally of some remote see, to whom the Pope delegated a portion of his authority, or to any ecclesiastic invested with power to exercise episcopal jurisdiction in some place where the ordinary was for some reason incapable of discharging his duties efficiently. Now vicars-apostolic, who are nearly always titular bishops, are appointed where no episcopate has been established, or where the succession has been interrupted. There are at present a large number of such vicariates in existence.

VICAR-GENERAL, in the Roman Church, a clerk, usually (but not necessarily) in holy orders, and having a degree in canon law, appointed by a bishop to assist in the discharge of episcopal functions. In matters of jurisdiction the vicar-general is regarded as the ordinary, and there is no appeal from the former to the latter; but the vicar-general may not do any of those things which belong to the episcopal order. A bishop is not obliged to appoint a vicar-general, but may appoint two or more if necessary. The office corresponds closely to that of an archdeacon in the early and mediæval Church. In the Anglican Church, an officer employed by the Archbishop of Canterbury and some other bishops to assist in such matters as ecclesiastical causes and visitations.

VICE-ADMIRAL. See ADMIRAL.

VICE-CHANCELLOR, an officer next in rank to a chancellor; the deputy of a chancellor.

In English law, a judge in the Chancery division of the High Court of Justice in England, holding a separate court. The office was abolished by the Judicature Act. The first Vice-Chancellor was appointed in 1813; the last holder of the office was Sir John Bacon, who retired Nov. 11, 1886. In Ireland there is a Vice-Chancellor, and the judge of the local Court of Chancery of the Duchy of Lancaster is also styled a Vice-Chancellor. In some of the United States there exists a judicial office analogous to the British institution described above. Where a State has a court of chancery, the highest incumbent is termed chancellor and the next vice-chancellor.

VICENZA, a town of north Italy; capital of a province of the same name; 49 miles W. of Venice, on the Bacchiglione, where joined by the Retrone at the foot of some wooded hills. It is well built, containing handsome streets and several elegant squares. The public buildings are almost all the work of Palladio, who was born here, or of scholars who rather slavishly imitated him. The most remarkable edifices are the Duomo or cathedral; the Palazzo della Ragione (town hall), an ancient Gothic building, with fine connected buildings, by Palladio; the Museum, one of Palladio's finest buildings; the Palazzo-Prefetizzio, and the theater, both by Palladio; the lyceum, churches, and hospitals. The manufactures are silk, woolen, and linen tissues, leather, earthenware, hats, etc. Vicenza (Vicentia) was founded above a century before the Christian era, and became a Roman municipal town. Pop. about 57,016.

VICE-PRESIDENT, one who holds office next to a president. The Vice-President of the United States is the second executive officer of the government, and is elected at the same time and in the same manner as the President. During the life and active health of the President his executive functions are in abeyance, his duties being confined to the presidency of the Senate during the sessions of Congress. In the Senate he has no vote, except in case of a tie between the opposing parties on a division of the House. Then, as is usual with parliamentary presiding officer, he has the casting vote. In the event of the death

or incapability of the President, the Vice-President assumes the duties of the office and continues to discharge them (in case of the President's death) till the end of the term for which the two were elected, or (in case of temporary disability) till the disability of the President shall have passed away. Several times in the history of the country has the Vice-President been called to the presidential chair—the first case being that of John Tyler, who succeeded William H. Harrison; then came Millard Fillmore, who succeeded Zachary Taylor; Andrew Johnson, who succeeded Abraham Lincoln; Chester A. Arthur, who succeeded James A. Garfield; and Theodore Roosevelt, who succeeded William McKinley. (See UNITED STATES.)

VICEROY, the governor of a kingdom or country, who rules in the name of the king or queen with regal authority as the king's or queen's substitute.

VICHY, a town of France, in the department of the Allier; in a valley of the river of that name, about 70 miles S. E. of Paris. It was once a place of strength, and is celebrated for its thermal alkaline springs. The Vichy waters are in much request for disorders of the stomach and bowels, and of the urinary organs, in gout, rheumatism, etc. Much of the water is sent out in bottles. Pop. about 17,500.

VICKSBURG, a city and county-seat of Warren co., Miss.; on the Mississippi river, about 1 mile S. of the mouth of the Yazoo, and on the Yazoo and Mississippi, the Alabama and Vicksburg, and the Vicksburg, Shreveport, and Pacific railroads; 45 miles W. of Jackson. The site is elevated and uneven, but in the midst of beautiful scenery. Here are St. Francis Xavier's Academy, St. Aloysius' Commercial College, Charity Hospital, waterworks, electric lights, a National cemetery (in the suburbs) where 17,000 Union dead are buried, court house, a United States government building, National and State banks, and a number of daily and weekly newspapers. Vicksburg is a port of entry, and has an extensive trade in cotton, of which it ships about 90,000 bales annually. It has railroad car shops, foundries, cotton-seed oil and lumber mills, and many smaller industries. During the Civil War Vicksburg was strongly fortified by the Confederates, who several times repulsed land and naval attacks, but were forced to surrender to General Grant, July 4, 1863, after a long siege. In 1876 the river cut through a neck of land, making the city an island. Since then the National Government has been restoring the harbor at a cost of about $1,250,000. Pop. (1910) 20,814; (1920) 18,072.

VICTOR AMADEUS I., Duke of Savoy; born in 1587, son of Charles Emmanuel I., and crowned 1630. He married the sister of Louis XIII. of France, and in his later years commanded the forces of that sovereign in his Italian wars. He died in 1637.

VICTOR AMADEUS II., Duke of Savoy, and first King of Sardinia; born in 1666; succeeded his father in the duchy, in 1675. He married Maria d'Orleans, niece of Louis XIV., but entered, nevertheless, on a tortuous policy, which involved him in a war with that monarch. Having acquired Sicily, he exchanged that kingdom in 1718, for Sardinia, by treaty with the emperor. He died in 1732, two years after his abdication in favor of his son.

VICTOR AMADEUS III., son and successor of Charles Emmanuel III.; born in 1726, ascended the throne in 1773. He founded the Academy of Sciences at Turin, and exhibited the utmost anxiety for the welfare of his subjects. His hostility to the revolution in France provoked a contest with that country, in which his throne fell by the arms of Bonaparte. He died in 1796.

VICTOR EMMANUEL I., King of Sardinia, son of Victor Amadeus III.; born in 1759, succeeded his brother, Charles Emmanuel IV., 1802, abdicated during a revolt, 1821, and died in 1824.

VICTOR EMMANUEL II., King of Italy, son of Charles Albert, King of Sardinia; born in Turin, Italy, March 14, 1820. While heir apparent, he fought in the campaign against the Austrians, which, terminating in the disastrous battle of Novara, caused his father to abdicate. He became king in 1849, under the most unfavorable circumstances, for he had to avert the consequences of a most disastrous war, to allay faction, and to preserve the constitution; to annul which, it is said, Austria endeavored to bribe him with the offer of Parma. On securing the services of eminent statesmen, and chiefly of the illustrious Cavour, he obtained a treaty of peace with Austria on comparatively easy terms, and undertook the complete reorganization of finances, the army, and the system of public education. After forming a close alliance with France, Victor Emmanuel, in 1859, again engaged in a war with Austria, which power, after being totally defeated in a short campaign, abandoned Lombardy to the Italians. In 1861,

Victor Emmanuel was proclaimed King of Italy. In 1866, as the ally of Prussia, his army was defeated at Custozza, and his fleet at Lissa; but the success of the Prussians at Sadowa restored Venetia to Italy, the unification of which kingdom Victor Emmanuel completed in 1870, by making Rome his capital. The personal character of the first King of Italy bore a close resemblance to that of Henry IV., King of France, and, like that monarch he possessed a bonhomie



VICTOR EMMANUEL II.

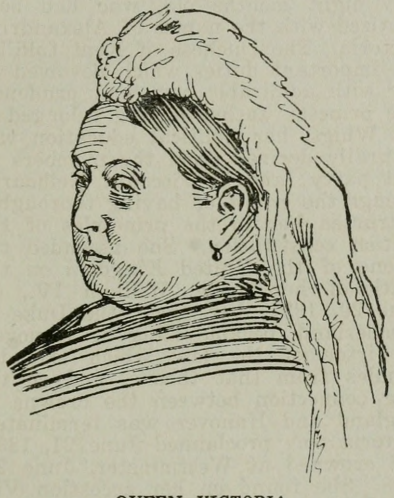
which rendered him popular among all classes of his subjects. Like Henry Quatre, too, Victor Emmanuel II. on several fields of battle displayed an almost reckless bravery; while his penchant for the fair sex was as notorious as that of his illustrious prototype. Victor Emmanuel died in Rome, Jan. 9, 1878, and was succeeded by his son Humbert.

VICTOR EMMANUEL III., King of Italy, born in Naples, in 1869, the son of King Humbert. After the assassination of his father by a fanatic he ascended the throne of Italy, on Nov. 11, 1900. In 1887 he entered the Army as a second lieutenant, becoming a colonel in 1890, when he was given command of First Italian Infantry at Naples. In 1896 he married Princess Helene, the daughter of Prince Nicholas, ruler of Montenegro, by whom he had four daughters and a son, the latter the present heir apparent, Prince Umberto, born in 1904. In spite of small size and insignificant appearance, King Victor has been very popular among the masses on account of his democratic manners and the obviously sincere interest he takes in the welfare of the people as a whole, notable in his fair attitude toward the labor organizations during the labor troubles in 1920.

VICTORIA, Queen of the United Kingdom of Great Britain and Ireland and Empress of India, only child of Edward, Duke of Kent (fourth son of George III.); born in Kensington Palace, May 24, 1819. Her mother, Victoria Maria Louisa (1786-1861), was the daughter of Francis, Duke of Saxe-Coburg, and sister of Leopold, King of the Belgians. Her first husband, the Prince of Leiningen, died in 1814; and in 1818 she married the Duke of Kent. The duke died in 1820, leaving his widow in charge of an infant daughter only eight months old, who had been baptized with the names of Alexandrina Victoria. The Duchess of Kent fulfilled the important duties which devolved on her with admirable care and prudence. The princess' father having belonged to the Whigs, her political education was naturally derived from the members of that party; and to Viscount Melbourne belongs the credit of having thoroughly instructed her in the principles of the British constitution. She ascended the throne of the United Kingdom on the death of her uncle, William IV., on June 20, 1837; her uncle, the Duke of Cumberland, became King of Hanover, in virtue of the law which excluded females from that throne, and so the long connection between the crowns of England and Hanover was terminated. Victoria was proclaimed June 21, 1837, and crowned at Westminster, June 28, 1838. She found on her accession Viscount Melbourne at the head of the government; and on a change of administration (1839) she refused to change, in accordance with precedent, the ladies of the bedchamber, the result being that Peel resigned and Melbourne's administration was prolonged till 1841. The young queen was married at St. James' Palace (Feb. 10, 1840) to Prince Albert, Prince of Saxe-Coburg and Gotha, and second son of the then reigning duke.

The death of the Prince-Consort in 1861 led his widow to seclude herself for several years from public life, but, though she never afterward took so prominent a part in public life, she never neglected any of her essential duties as queen. Other severe trials were the deaths of the Princess Alice (of Hesse), of the Duke of Albany, and of the Duke of Clarence, her grandson. No former monarch so thoroughly comprehended the great truth, that the powers of the crown are held in trust for the people, and are the means and not

the end of government. This enlightened policy entitled her to the glorious distinction of having been the most constitutional monarch Great Britain has ever seen. Not less important and beneficial was the example set by her Majesty and the Prince-Consort in the practice of every domestic virtue. Their stainless lives, their unobtrusive piety, and their careful education of the royal children bore rich fruit in the stability of the throne. The progress made by the nation in the various elements of civilization and in material prosperity was unparalleled, and perhaps during no reign was there a greater measure of political contentment. In September,



QUEEN VICTORIA

1896, her reign had reached a point exceeding in length the reign of any other English sovereign. The celebration of the occasion was postponed till June, the anniversary of her accession to the throne, 60 years previous.

Queen Victoria had four sons and five daughters; the Princess Royal, Victoria, born 1840, married in 1858 to Frederick William, afterward Emperor of Germany; Albert Edward, Prince of Wales, born in 1841 and married in 1863 to Alexandra, daughter of the King of Denmark; Alice, born in 1843, married in 1862 to Prince Frederick William of Hesse, died in 1878; Alfred, born in 1844, created Duke of Edinburgh 1866, married in 1874 to Marie, daughter of the Emperor of Russia, died in 1900; Helena born 1846, married in 1866 to Prince Christian of Denmark; Louise, born 1848, married in 1871 to the Marquis of Lorne; Arthur, born in 1850, created Duke of Connaught 1874, married in 1879 to Princess Louise Marguerite of Prussia; Leopold, born 1853, created Duke of Albany in 1881, married to Princess Helena of Waldeck in 1882, died 1884; and Princess Beatrice, born 1857, married in 1885 to Prince Henry of Battenberg, died 1896. In the fall of 1900 the queen's health began to fail, and she died in Osborne House, Isle of Wight, Jan. 22, 1901.

VICTORIA, a British colony in Australia; bounded N. by New South Wales, S. E. by the Pacific, S. by Bass Strait and Southern Ocean, and W. by South Australia; area 87,884 square miles; pop. about 1,500,000. It has about 600 geographical miles of sea-coast, with considerable bays and indentations, especially about the middle, where Port Phillip Bay, with an area of 875 square miles and an entrance barely 2 miles wide, affords shelter sufficient for the largest fleet.

Topography.—The interior, though diverisfied by mountains, is chiefly distinguished by vast unwooded plains mostly occupied as pasture. There is one principal mountain range, a portion of the Great Dividing Range of Eastern Australia, running from E. to W. through the colony, with various offshoots. The E. portion of it, called the Australian Alps, with numerous N. and W. ramifications, rises in Mount Bogong to 6,500 feet, in Mount Hotham to 6,100 feet, and has several peaks exceeding 5,000 feet. The most W. portion, called the Grampians, runs N. and S., and in Mount William reaches a height of 5,600 feet. The Grampians and Australian Alps are connected by such ranges as the Pyrenees and Hume Range, containing numerous cones and extinct craters, and composed of metamorphic rocks of granite, quartz, syenite, etc. This is the region of the gold-fields.

Waterways.—The rivers are numerous, but generally small and dry up in summer, leaving the country parched. The chief is the Murray, which rises in the Australian Alps, forms the N. boundary of the colony for 980 miles, is in all 1,300 miles long, and is navigable for several hundred miles. The Yarra Yarra is a short navigable river, on which, at its entrance into Port Phillip Bay, Melbourne, the capital is situated. Others are the Goulbourn, Snowy, Glenelg, Wimmera, and Loddon. Lakes are numerous but small, and many of them are salt.

Climate.—The climate of Victoria is temperate, but liable to sudden fluctuations; and hot winds blow at intervals from November to February, causing

great discomfort. The hottest period is in January and February, when the thermometer may rise to 108° in the shade. Some of the common English quadrupeds and birds have been introduced, such as hares, rabbits, deer, pheasants, partridges, larks, etc., and have become quite plentiful. Rabbits are now so numerous in some districts as to prove a nuisance.

Production and Industry.—The acreage and production under the principal crops in 1919 was as followes: wheat, 2,214,000 acres, production 25,240,000 bushels; oats, 343,000 acres, production, 5,275,000 bushels; barley, 100,000 acres, production, 2,229,000 bushels; potatoes, 52,000 acres, production 138,000 bushels; hay 984,000 acres, production 1,114,000 tons. The total value of agricultural products in 1917-1918 was £14,401,173. The gold production in 1919 was 135,427 ounces, valued at £575,260. There were about 3,500 miners employed in the gold fields. The mineral production in 1918 was valued at £1,342,322. There were in 1918 5,627 manufacturing establishments, and the value of the product was £67,066,715. The total value of overseas imports in 1918-1919 was £34,822,019, and of exports £27,824,749. There were in 1919 330 lines of double railway track and 3,867 miles of single track, or a total of 4,197 miles. The total revenue in 1919 amounted to £12,786,589, and the expenditures to £12,468,068. The public debt on June 30, 1918, amounted to £78,192,-361.

Education is compulsory for children between the ages of 6 and 14. In 1918 there was a total enrollment of 254,461 scholars in the schools. Secondary education is for the most part under the control of private persons or proprietary bodies. The University of Melbourne has four colleges affiliated with it; Trinity, Ormond, Queens and Newman.

Government.—The government is invested in a governor appointed by the crown, aided by an executive ministry consisting of 12 members, and a Parliament consisting of a legislative council of 34 members and a legislative assembly of 65 members.

History.—Victoria was first colonized from Tasmania in 1834. It made rapid progress, especially in sheep breeding, and the discovery of gold in 1851 caused a rush of population from all parts. Hitherto it had been known as Port Phillip, and formed part of New South Wales, but in this year (independently of the gold discovery) it was erected into a separate colony under the name of Victoria. In 1850 the population numbered 76,162; in 1854 it was 312,307. In 1856 responsible government was conferred on the colony. The chief towns are Melbourne (the capital), Geelong, Ballarat, and Sandhurst. See AUSTRALIA: AUSTRALIAN COMMONWEALTH.

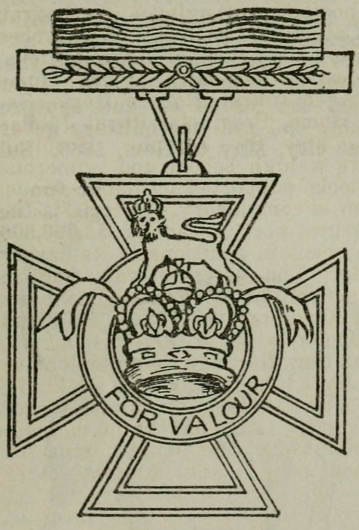
VICTORIA, a city and capital of the province of British Columbia, Canada; at the S. E. extremity of Vancouver Island, on the Strait of Fuca, and on the Esquimalt and Nanaimo railroad; 750 miles N. of San Francisco. It is built on slightly undulating ground, and has a mild climate, with much less rain in the winter than at other points on the coast. The summer is dry and free from excessive heat. There is an inner and an outer harbor. The first is shallow and the largest ocean steamers can enter the latter. Here are many wide streets, beautiful residences and grounds, splendid drives, suburban scenery unsurpassed by any city in the world, Beacon Hill Park and recreation grounds, artistically laid out in arboreal, floral and other embellishments, and the building of the Provincial Legislative Assembly, erected at a cost of $750,000, the Government House, the lieutenant-governor's residence, Supreme Court house, custom house, postoffice, Anglican Cathedral, Roman Catholic Cathedral, and churches representing the principal denominations, the Protestant Orphan's Home, Home for the Aged Infirm, Refuge Home, Samaritan Home, Provincial Royal Jubilee Hospital, and St. Joseph's Hospital. There are a high school and numerous ward schools, supported by public funds. Education is compulsory. Victoria is the second largest port in Canada. $6,000,000 has been spent in additions to its harbor and docks. The assessed valuation in 1919 was over $110,000,000. The bank clearings amounted to £123,351,345, and the customs receipts to $1,496,440.

Surrounding the city is an extensive district abounding in game of all kinds, deer, pheasant, grouse, quail and larger game. Victoria is an important mercantile and manufacturing point, having for years been the principal trading center for the whole British territory W. of the Rocky Mountains. Vessels from all parts of the world visit its harbor. The duties from the imports here amount to about $1,000,000 annually. The city is lighted by gas and electricity, has a perfect system of sewerage, waterworks, electric street railways, telephone and telegraph systems, and sash and door factories, lumber yards, shipyards, iron foundries, tanneries, book binding plants, biscuit factory, pottery, trunk factory, chemical works, flour mills, cold storage warehouses, etc., and several daily and weekly newspapers. Victoria was founded by the Hudson Bay Company as a

trading post in 1843. It was the headquarters of the Pacific sealing fleet till that industry was greatly reduced by the Bering Sea regulations. It became the capital of the province of British Columbia on the confederation with the Dominion of Canada in 1871. Pop. (1891) 16,841; (1901) 20,816; (1920) about 55,000.

VICTORIA, in Roman mythology, one of the deities of the Romans, called by the Greeks Nikê. She was sister of Strength and Valor, and was one of the attendants of Jupiter. Sylla raised her a temple at Rome, and instituted festivals in her honor. She was represented with wings, crowned with laurel, and holding the branch of a palm tree in her hand.

VICTORIA CROSS, an English naval and military decoration instituted by royal warrant, Jan. 29, 1856, and bestowed for "conspicuous bravery or devotion" to the country in the presence of the enemy. It is the most coveted of all British decorations, and is open to



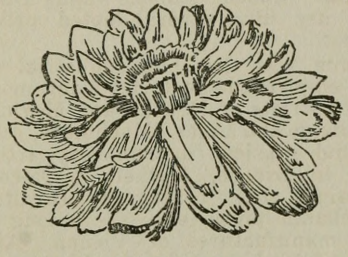
VICTORIA CROSS

all officers and men of the regular, auxiliary, and reserve forces. It consists of a bronze Maltese cross with the royal crest in the center, and underneath an escrol bearing the inscription, "For Valour." It is worn attached to the breast by a blue ribbon in the case of the navy, and a red in the case of the army. For every additional act of bravery an additional clasp may be added. The cross carries with it a special pension of $50 a year, and each additional clasp an additional pension of $25 a year.

VICTORIA NYANZA, a great freshwater lake in east central Africa, situated on the equator; area, over 30,000 square miles. It lies about 3,880 feet above sea-level. The geological evidence points to the origin of its basin having taken place at a very remote period, a number of terrace-like faults along the W. shores suggesting a series of immense landslips as a probable cause of the formation of the hollow which now contains the lake. The traces of volcanic action do not seem sufficient to account for so large a depression. The prevailing rocks are gneiss and schists, with porphyritic granite at the S. extremity, and some lava and ironstone toward the N. The igneous area is, upon the whole, barren and desolate looking, the remainder of the basin being clothed with luxurious tropical flora, exceedingly varied in character. This variety is, perhaps, most strikingly exhibited on some of the islands. The fauna is also varied, the number of alligators frequenting the waters being very large. Hippopotami, though less frequently met with, are exceedingly fierce, and are held in great dread by the native boatmen. The water is good and fresh, though somewhat insipid to taste, and frequently assumes a dirty white color. The lake is drained by the Nile, and its chief feeders are the Kajera, the Nzoia, the Shimiyu, and the Katonga. The lake, whose native name is Ukerewe, was discovered by Speke in 1858, visited by him and Grant in 1861-1862, and subsequently partly explored by Stanley (1875), Mackay, Thomson, and others.

VICTORIA REGIA, a genus of *Euryalidæ*, akin to *Euryale*, from which it differs by the sepals being deciduous, by the petals gradually passing into stamens, and by the cells of the ovary being more numerous. Species, one or three. The type is *Victoria regia*, named by Lindley after Queen Victoria. It is the most magnificent of all known water lilies, and is the more acceptable that it came from a region in which it had been supposed that no *Nymphæaceæ* occurred. It was first discovered by the botanist Hænke in 1801; Bonpland afterward met with it. Orbigny, in 1828, sent home specimens to Paris; others also subsequently saw it growing, but it excited no attention till, in 1837, Sir Robert Schomburgk found it in the Berbice river in British Guiana. The rootstock is thick and fleshy, the leaf-stalks prickly, the leaf peltate, its

margin circular, its diameter from 6 to 12 feet, the edge so turned up as to make the leaves floating in tranquil water look like a number of large trays. The leaves are green above, and covered with small bosses, below they are deep purple or violet; the undeveloped flowers are pyriform, the sepals four, each about seven inches long by four broad, purple externally, whitish internally; the petals numerous, in several rows, passing insensibly into stamens, fragrant, the outer ones white, the



VICTORIA REGIA

inner ones roseate; stamens numerous, the outer fertile, the inner sterile; ovary many celled, cup-shaped above, with many small stigmas along its upper margin; fruit a prickly berry. A native of South American rivers, especially the tributaries of the Amazon. The seeds are said to be eatable, and the plant is in consequence called water maize by the natives of the region where it grows.

VICUNA, in zoölogy, the *auchenia vicugna*, a native of the most elevated localities of Bolivia and northern Chile. It is very wild, and has resisted all attempts to reduce it to a state of domestication. It is the smallest species of the genus, standing only about 30 inches at the shoulder. Coloration nearly uniform lion-brown, tinged with yellow on the back and fading into gray on the abdomen. It is extremely active and sure-footed, and is seldom taken alive. In habit it somewhat resembles the chamois, as it lives in herds in the regions of perpetual snow. The soft, silky fur is in much request for making delicate fabrics, and many thousands of these animals are slaughtered annually for the sake of their skins.

VICUÑA-MACKENNA, BENJAMIN, a Chilean historian; born in Santiago, Chile, in 1831. He was concerned in many revolutions, traveled extensively, and held many political positions. In 1870 he acted as war correspondent during the Franco-German War; later as correspondent of the "Mercurio" in Berlin and Paris. At the opening of the war with Peru he became editor of "El Nuevo Ferrocarril"; and after the conclusion of the war his description of it became well known for its impartiality. He wrote "The Siege of Chile in 1813"; (1849); "History of Santiago' (2vols. 1868); "Francisco Moyén; or, What the Inquisition in America Meant" (1868); several books on the mineral riches of Chile (1883); "Album of the Glory of Chile" (1883); "Dolores" (1883); "The Isles of Juan Fernandez" (1884); "At a Gallop" (1885); "The War in Spain" (1887); and many others. He died in Santa Rosa del Colmo, Jan. 25, 1886.

VIELE, EGBERT LUDOVIKUS, an American civil engineer; born in Waterford, N. Y., June 17, 1825; was graduated at the United States Military Academy in 1847; took part in the Mexican War in 1847-1848 and in the campaign against the Indians in 1848-1852; served as State Engineer of New Jersey in 1854-1856, and was chief engineer and designer of Central Park in New York, and of Prospect Park in Brooklyn in 1856-1860. During the Civil War he commanded the land forces at the capture of Port Royal; directed the investment of Fort Pulaski, Ga.; planned and led the march on and capture of Norfolk, Va., and was military governor of that city, May to Nov., 1863. Subse-



VICUNA

quently he was park commissioner of New York City, a Democratic member of Congress, and vice-president of the American Geographical Society. In 1896 he appeared before the commission of the British House of Lords on the subject of municipal administration. His publications include "Handbook of Ac-

tive Service" and "A Topographical Atlas of the City of New York." He died in 1902.

VIENNA (German, Wien), the capital and largest city of the Republic of Austria; in Lower Austria, on the Danube canal, a branch of the Danube. The small river Wien flows through part of the city to join the canal. Vienna consists of the Inner City and eight districts or sections completely surrounding it—viz., Leopoldstadt, Landstrasse, Wieden, Margarethen, Mariahilf, Neubau, Alsergrund, and Favoriten. These, with the exception of the last, an artisans' quarter, are inclosed by fortifications known as the Lines, though that name is now usually confined to the 15 gates of the fortifications. Immediately beyond the Lines are nine populous suburbs included (since 1890) within the Vienna police district, which has a total area of 51 square miles. The irregular hexagon formed by the Inner City was till 1858 inclosed by an inner line of fortifications, the site of which is now occupied by the Ringstrasse, a series of handsome boulevards, 55 yards wide, which bound five of its sides. The sixth side is bounded by the Franz-Josefs Quay, on the Danube canal.

Though Vienna contains buildings of the 14th and even of the 13th century, it is, in its present form, essentially a modern city; nearly all the most conspicuous and pretentious public buildings date from the later half of the 19th century. The Inner City and the Ringstrasse were formerly the handsomest and most fashionable quarters. In the former are the cathedral of St. Stephen (1300-1510), with a tower 450 feet in height; the Hofburg or imperial palace, a large and irregular pile of very various dates; and many palaces of the nobility. On one side or other of the Ringstrasse rise the Exchange; the University (1874-1884); the huge Gothic New Rathhaus (1873-1883), built at a cost of over $3,750,000; the Parliament House; the Supreme Law Courts; the Imperial Museum of Natural History and of Art (1872-1886), twin buildings on either side of the imposing monument of the Empress Maria Theresa (unveiled 1888); the imperial Opera House; the Academy of Art; the Austrian Museum of Art and Industry, etc. In other parts of the city are the Arsenal; the Josephinum, a medical college founded in 1784; the Votive Church, an admirable specimen of modern Gothic, built in 1856-1879 to commemorate the emporer's escape from assassination in 1853; and many other handsome sacred and secular edifices. Vienna is well provided with public parks, the largest being the Prater (7 square miles), one of the finest parks in Europe, opened in 1776. In educational, scientific, artistic, and benevolent institutions the city is very rich. The university, founded in 1365 and renowned throughout the world as a medical school, had a teaching staff of 350 and over 6,000 students. The magnificent public picture gallery, formerly in the château of Belvedere, now in the Museum of Art, is specially famous for its unrivalled examples of the Venetian school, Rubens and Dürer. There are also several noted private galleries.

Vienna was the chief industrial city in the empire, the factories being mostly in the districts of Neubau and Mariahilf and outside the Lines. Machinery, scientific and musical instruments, artistic goods in bronze, leather, terra-cotta, porcelain, etc., bent-wood furniture, meerschaum pipes, etc., are among the noted manufactures of Vienna. As a center of trade and finance Vienna was no less important. Grain, flour, cattle, seeds, wines, and manufactured goods of all kinds were annually handled here to an immense aggregate value. Over $12,500,000 were spent in 1868-1881 in regulating the channel of the Danube so as to render the river naviglable at all times.

Vienna occupies the site of the Roman Vindomina, which was established in A. D. 14, as the successor of the Celtic settlement of Vindobona. The beginning of its present importance, however, dates only from the period of the Crusades, which directed a steady stream of traffic through it. In 1276 it became the capital of the Hapsburg dynasty. The famous siege of Vienna by the Turks lasted from July 14 to Sept. 12, 1683, when it was relieved by John Sobieski of Poland.

Treaties have been concluded at Vienna in 1738, between the Emperor Charles VI. and the Infanta of Spain as to the kingdom of the Two Sicilies; in 1809, between Napoleon and the Austrians, after the defeat of the latter at Wagram; in 1864, settling the affairs after the war of Prussia and Austria against Denmark; and in 1866, between Francis Joseph of Austria and Victor Emmanuel of Italy, ceding Venetia to Italy. The Great Congress of Vienna (Nov. 3, 1814, to June 9, 1815) met to regulate the affairs of Europe after the overthrow of the Napoleonic empire, and restore the "balance of power." Alexander I. and Nesselrode were there in the interests of Russia; the King of Prussia was supported by Hardenberg; Castlereagh, and afterward Wellington,

represented Britain; Metternich was Austrian plenipotentiary; Talleyrand secured a hearing for France; Spain, Portugal, Sweden, Denmark, Rome, and the minor German states were also represented.

The chief final outcome was that Austria obtained Lombardy, Venetia, Illyria, Dalmatia, Tyrol, Vorarlberg, Salzburg, and east Galicia; Prussia the province of Saxony, Posen, Swedish Pomerania, Westphalia, and the Rhenish province; Hanover, extended in area and made a kingdom, fell to the Hanoverian dynasty in Great Britain; Great Britain secured Malta, Heligoland, Cape Colony, and Mauritius, and the protectorate of the Ionian Islands; Belgium and Holland were united as the kingdom of the Netherlands; Norway was confirmed to Sweden; the duchy of Warsaw (Poland) was made over to Russia, and the republic of Cracow was constituted; the neutrality of Switzerland was guaranteed, and Neuchâtel (under Prussian sovereignty) added to the confederation; the German confederation was constituted with numerous internal rearrangements; and the former ruling houses were reinstated in Naples, Sardinia (to which Genoa was annexed), Tuscany, and Modena, Parma being given to the ex-Empress Maria Louisa; the papal See recovered nearly all its possessions; and France was restricted to very nearly the territory it possessed before the Revolution. The signing of the treaty, June 9, was hastened by the news of Napoleon's return from Elba. Pop. about 2,000,000.

On the establishment of the republic of Austria, Vienna became its capital. The conditions brought about by the position of the Empire, and the practical isolation of Austria from other countries, placed Vienna in a deplorable economic and political situation. The city had hitherto drawn its prosperity from countries which formerly formed a part of the Austro-Hungarian empire, or from those which bordered on it. The establishment of new governments, independent of Austria, and largely hostile to it, cut off Vienna from the commercial advantages which it formerly enjoyed. These conditions brought about the almost complete stagnation of commercial and industrial life. During 1919, 1920, and 1921, the greater part of the people of the city were reduced to the greatest extremities, in spite of efforts at relief by the United States and other countries. The population decreased greatly and the problem of the future of the city was one which it seemed impossible to solve.

VIENNA BASIN, in geology, a series of beds—the lowest Oligocene, the highest Pliocene—found in a basin-shaped hollow in the older rocks in and around Vienna. The Oligocene contains remains of *Mastodon tapiroides*, *Rhinoceros sansaniensis*, etc., and the Pliocene, dinotherium, mastodon, rhinoceros, machairodus, hyæna, cervus, antelope, etc., with birch, alder, oak, beech, chestnut, hornbeam, liquidambar.

VIENNE, a department in the W. of France constituted mainly of the old province of Poitou, between Indre and Deux-Sèvres; area, 2,711 square miles; pop. about 330,000. The Vienne, an affluent of the Loire, is the principal river, and has the Creuse as its chief tributary. The surface is mostly flat, with a gradual slope from the N. The country consists almost wholly of fertile plains, fine pasture lands, and extensive forests. The mineral riches comprise iron, manganese, and quarries of stone, including lithographic stone. Poitiers is the capital.

VIENNE, one of the most ancient towns of France, in the department of Isère; on the Rhone, 19 miles S. of Lyons. The river Gère passes through the town, and here joins the Rhone, after having supplied motive power to a number of mills and factories. Vienne was the chief town of the Allobroges, is mentioned by Cæsar, and by Martial; in the time of the Roman emperors it was the rival of Lyons. Besides numerous water conduits, etc., of Roman construction, there are a Corinthian temple of Augustus and Livia, remains of a theater and a pyramid, called The Eagle, 72 feet high; and the museum containing many relics of Roman antiquity. The cathedral of St. Maurice, partly Romanesque, partly Gothic, was built in 1107-1251; St. Peter's dates from the 6th century. The town was prominent under the Burgundian princes, and its archbishop disputed with his neighbor of Lyons the primacy of Gaul. In 1312 a council was held here, in which Pope Clement V. pronounced the suppression of the order of the Templars. There are manufactures of woolens, silk, paper, leather, and iron goods, and trade in grain and wine. Pop. about 25,000.

VIENNE, HAUTE, an interior department of France, S. E. of Vienne; bounded on the W. by departments of Vienne, Charente, and Dordogne; area, 2,119 square miles; pop. about 385,000. It is watered by the Vienne and tributaries. The surface is for the most part level, though not fertile, but is

traversed by ranges of low hills, including the Monts du Limousin. There is much cattle breeding. Kaolin is the chief mineral product, and much porcelain is made.

VIEUXTEMPS, HENRI, a Belgian composer; born in Verviers, Belgium, Feb. 20, 1820; began to give concerts in his 13th year, and after completing his studies at Vienna and Paris spent most of his time in traveling from place to place as a performer till in 1870 he became a teacher in the Brussels conservatoire. He retired in 1873. His works comprise concertos, fantasies, and dances for the violin. He died June 6, 1881.

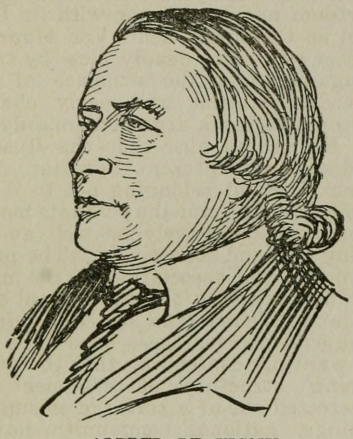
VIGFÚSSON, GUDBRAND, a Scandinavian scholar; born in Frakkanes, Iceland, March 13, 1827. He was educated first at the high school of Reikiavik, afterward at Copenhagen University. He lived in Copenhagen from 1849 till 1864, having devoted himself to the study of old Icelandic literature. His first work, "Timatal," on the chronology of the Sagas, was published in 1855, and revealed the hand of a master. In 1858 he brought out the "Biskupa Sögur, or Lives of the Icelandic Bishops," and in 1864 the "Eyrbyggja Saga." In the latter year he came to England to undertake the Icelandic-English lexicon, begun by Cleasby, and in 1866 began at Oxford this work, which kept him engaged for seven years, the result being the excellent dictionary issued from the Clarendon Press. In 1878 the Clarendon Press published his "Sturlunga-Saga," to which he prefixed "Prolegomena" containing a complete history of the classic literature of Iceland. This was followed by several minor works and essays by the "Orkneyinga Saga" and "Hakonar Saga" and by the "Corpus Poeticum Boreale" (in conjunction with F. York Powell), a complete collection of the ancient Icelandic poetry, with translation. He was latterly engaged upon a work entitled "Origines Islandiæ," but died before its completion. In 1884 he was appointed lecturer in Icelandic and kindred subjects at the University of Oxford. He died in Oxford, England, Jan. 31, 1889.

VIGIL, in ecclesiastical and Church history, originally the watch kept on the night before a feast (from the 11th or 12th century) the day and night preceding a feast. The practice of spending the night in public prayer, which is probably older than Christianity, prevailed in the early Church, and down to the 14th century was the usual prelude to the greater festivals. But there were many objections to the custom, which, from about that date was gradually discontinued. In the Roman Church the Midnight Mass before the feast of Christmas is the only relic of the old custom. Broadly speaking, the vigils of the Roman Church have been transferred to the English Prayer Book. Theoretically, all vigils are fast-days, but in the Roman Church the customs of different countries vary slightly. Also the devotional exercises or services appropriate to the vigil or eve of a festival.

VIGNAUD, (JEAN) HENRY, an American diplomatist; born in New Orleans, Nov. 27, 1830; engaged in teaching and newspaper work till the outbreak of the Civil War, then became a captain in the 6th Louisiana Regiment; was taken prisoner at New Orleans in 1862. After his release, as secretary of the Confederate Diplomatic Commission, he went to Paris in 1863. He was connected with the Alabama Claims Commission in 1872, and in the following year was a United States delegate to the International Metric Conference. He was made second secretary to the American legation in Paris in 1875 and first secretary in 1882, serving until 1909. He published several books on Columbus and on early voyages to America.

VIGNY, ALFRED VICTOR, COMTE DE, a French author; born during his parents' imprisonment in the prison at Loches (Indre-et-Loire), March 27, 1797; entered the army at the Restoration; and served 14 years. Garrison life wearied a soul athirst for glory, but his pride found a solitary consolation in verse. As early as 1822 he published anonymously a small volume of verse, followed in 1824 by "Eloa, or the Sister of an Angel," an exquisite piece of mystic phantasy. Before the Revolution of July he had published his collected "Poems, Antique and Modern" (1826), containing "Moïse" and "Dolorida"; "Cinq Mars" (1826), a historical romance; a translation of "Othello" (1829); and a drama "The Farrier of Ancré" (1830). After that year he published only works in prose: "Stello" (1832); "Grandeur and Military Servitude" (1835); and a drama, "Chatterton" (1835)—the highest moment of his fame. From that time he ceased not to write but to print. He left a volume of verse—"Destinées"—published in 1864, which contains some of his finest and most virile work, and a collection of personal notes, printed with doubtful wisdom by Louis Ratisbonne under the title "Journal of a Poet" (1867). While still young he attached himself to the

Romanticists, with Hugo, Deschamps, Mme. Desbordes-Valmore, and Mdlle. Delphine Gay. But he was never a militant or thorough-going member of the party—"he retired," says Sainte-Beuve, "to his ivory tower before the heat of the day." His "Fifth of March" was a romance based on the most tragic of the crimes of Richelieu, inspired by Scott, but intended to be minutely true to history throughout. The author's



ALFRED DE VIGNY

connection with the theater led to an equivocal friendship with Mme. Dorval, commencing about the close of 1830, but the woman's heart soon found poetry a poor substitute for passion, and the tragedy left the poor idealist stripped of his last illusion. In 1845 Vigny was gratified by election to the Academy, on which occasion he made a long and wearisome address, which was listened to with unconcealed impatience. Thereafter till the close he lived but little in the world, in familiarity with no one, not even himself, his thought wrapped up in a pessimistic gloom from which he found escape only by the avenues of art. His was that profoundest kind of moral misery which needs no external reason for its being, incurable because itself its own poison. He died in Paris after the long agony of cancer, Sept. 17, 1863. Vigny's work was elegant but cold. No poet has had grander conceptions than the few fundamental ideas that inform his work, and it is not so much inspiration as meditation that gives the key note to all his poetry.

VIGO, a seaport town of Spain, in the province of Pontevedra. It is inclosed by a wall and trench, and has an excellent harbor with deep anchorage close in-shore. It was captured by the English in 1719. It has a lazaretto, a fortress, an export trade in wine, bacon and maize, and a prosperous pilchard fishery. It is a port of call of several steamship lines. Pop. about 45,000.

VIJAYANAGAR, a ruined city 8 miles in circuit, in Madras province, British India; about 40 miles to the N. W. of Bellary, in a plain encumbered with granite rocks, many of which have been rudely sculptured into a variety of forms. After having been for two centuries the metropolis of a powerful Hindu kingdom, Vijayanagar was sacked and ruined by the Mohammedans of the Deccan in 1565. At that date it is described as 24 miles round. The ruins of the ancient city, the building of which was begun in 1336, now cover 9 square miles. The modern village on its site is called Hampi.

VIKING, a rover or sea robber belonging to one of the bands of Northmen who scoured the European seas during the 8th, 9th, and 10th centuries. This word has been frequently confounded with sea-king, a term which is applied to a man of royal race, who took by right the title of king when he assumed the command of men, although only of a ship's crew; whereas the former term is applicable to any member of the rover bands.

VILAINE, a river of France which rises in the department of Mayenne and flows into the Atlantic at Penestin, in the department of Morbihan. It is 140 miles long. Its principal tributaries are the Ille, Oust, Cher, Don, and Isac.

VILAS, WILLIAM FREEMAN, an American lawyer; born in Chelsea, Vt., July 9, 1840; removed to Madison, Wis., in 1851; and was graduated at Wisconsin University in 1858. He was admitted to the bar in 1860, and on the outbreak of the Civil War enlisted in the Union army in which he served till 1863; was Postmaster-General in 1885-1888; and subsequently was Secretary of the Interior in President Cleveland's cabinet in 1888-1889. He was United States Senator in 1891-1897, becoming a Gold Democrat in 1896. He died Aug. 27, 1908.

VILAYET, a name officially applied since 1865 to the large administrative districts of Turkey.

VILLA, FRANCISCO (PANCHO), a Mexican bandit leader, born in Chihuahua, the date being unknown even to himself, as he was the son of ignorant peon parents, Indian by race. Villa first became prominent in 1910, when he appeared as a guerrilla leader during the

revolutionary troubles, definitely espousing the cause of Carranza, when the latter began his campaign against President Huerta of the Republic, the slayer of the previous President, Francisco Madero. Carranza made Villa leader of the army advancing against Mexico City. The main resistance of the Huerta partisans was made at Torreon, where Villa, leading a much inferior force, distinguished himself by his brilliant and daring tactics, exciting the admiration of military strategists in all parts of the world. After his success and elevation to the Presidency, however, Carranza disagreed with Villa, denouncing him as a bandit, whereupon the latter declared war against the Carranza government and returned to his guerrilla tactics in the mountains. To create difficult relations between Carranza and the Government of the United States, Villa and his followers, early in 1916, crossed the international boundary and attacked the town of Columbus, N. M., killing a number of citizens and setting fire to a number of houses. The United States immediately despatched a large cavalry force across the frontier in pursuit of Villa and his band, which achieved no success, but brought about a very critical situation between the two countries. In 1920 Villa was pardoned by the new revolutionary government and granted a farm as a subsidy.

VILLAFRANCA, a town of Italy, in the province of Verona, on the Tartaro. It is celebrated as having been the center of the wars of 1848 and 1866. The preliminaries of peace between Napoleon III. and the Emperor of Austria were signed here, July 11, 1859. Pop. about 12,000.

VILLAGE COMMUNITY, the means by which many scholars contend that great part of Europe must have been brought into cultivation. A clan of settlers took a tract of land, built their huts thereon, and laid out common fields, which they cultivated in common as one family. The land was divided out every few years into family lots, but the whole continued to be cultivated by the community subject to the established customs as interpreted in the village council by the sense of the village elders. This may still be seen in the villages of Russia, and even in some parts of England may still be traced the ancient boundaries of the great common field, divided lengthwise into three strops (one fallow, the two others in different kinds of crop), and again crosswise into lots held by the villagers. This theory, often called the mark system, was started by Von Maurer in Germany, but mainly owes its currency to Sir Henry Maine, who in his work entitled "Village Communities in the East and West" (1871) pointed out close parallels in the archaic land communities in India. The first serious attack upon the theory was made by F. Seebohm, in his work "The English Village Community Examined" (1883; 4th ed. 1890), which labors to prove that the ancient village community was not originally free, but traces back to the Roman manorial system of a community in serfdom under a manor with its lord. Fustel de Coulanges dealt Von Maurer's theory a still more deadly blow by turning against him the evidence of the Leges Barbarorum and early chartularies on which his argument mainly relied. He proves also that the Russian *mir* does not represent agrarian communism, the soil belonging not to it but to some one else, and the peasants merely paying rent collectively as well as cultivating the land collectively. The primitive mark, the association of the mark (*Markgenossenschaft*), the original common land (*Gemeinland* or *Allmende*)—all the evidence for these he weighs and finds wanting, contending that the whole imposing structure of argument has been erected out of a series of misunderstandings, national communism having been confused with the common ownership of the family, tenure in common with ownership in common, agrarian communism with village commons.

Mr. Gomme considers Lauder and Kells as surviving types of the tribal community in its most primitive form; besides the example of Hitchin, from which Mr. Seebohm started working back, he examines the cases of Aston village, in the parish of Bampton, Oxfordshire, Chippenham in Wiltshire, Malmesbury, and others, his conclusion being that the village community is no modern institution, but one beginning far back in the history of human civilization, and probably a phase through which all peoples have passed. In the hill cultivation and settlement, of which many traces remain, he sees evidence of pre-Aryan influence analogous to similar customs surviving in India. The community in its tribal form was the prominent feature, the village of serfs the subordinate; groups of kindred occupying their several homesteads and the lands around; small villages of serfs occupying cottage homes, massed together, and using the lands around them in intermixed or runrig occupation. Thus Mr. Seebohm's formula, defining the English institution as a manor with a village community in serfdom under it, he would rewrite as a tribal community with a village in serfdom under it.

VILLARD, HENRY, an American capitalist; born in Spire, Germany, April 11, 1835; received a good education; removed to the United States in 1853; and engaged in newspaper work in Chicago. In 1859, as a correspondent for the Cincinnati "Commercial," he was sent to the Colorado gold region; and during the Civil War was a correspondent in Washington, D. C., for Eastern and Western papers. In 1873, as agent for German stockholders, he bought the Oregon and California railroad and the Oregon Steamship companies. In 1875 with C. S. Greeley he was made receiver of the Kansas Pacific railroad. He next formed the Oregon and Transcontinental Company, which afterward controlled the Oregon Railway and Navigation Company and the Northern Company. In 1881-1884 he was president of the Northern Pacific, and in 1889-1893 was chairman of the board of directors. In 1890 he purchased the Edison Machine Works in Schenectady, N. Y., and the Edison Lamp works in Newark, N. J., and from these organized the Edison General Electric Company, of which he was president for two years. He made liberal donations to charitable, educational, and religious enterprises, and published "The Pike's Peak Gold Regions." He died in Dobbs Ferry, N. Y., Nov. 11, 1900.

VILLARD, OSWALD GARRISON, an American writer and editor, born at Wiesbaden, Germany, in 1872. He was a grandson of William Lloyd Garrison, was educated at Harvard University, and received honorary degrees from Washington and Lee University and from Lafayette College. From 1894 to 1896 he was assistant in United States History at Harvard, from 1896 to 1897 a reporter on the Philadelphia "Press"; and from 1897 to 1918 an editorial writer and president of the New York "Evening Post." After selling this newspaper, he became editor and owner of the New York "Nation." He was president of the board of the Manassas (Va.) Industrial School. Besides numerous magazine articles he wrote "John Brown—a Biography Fifty Years After" (1910); "Germany Embattled" (1915).

VILLARI, PASQUALE, an Italian historian; born in Naples, Italy, in 1827. His principal works are: "History of Girolamo Savonarola and his Times" (1859-1861); "Niccolo Machiavelli and his Times" (1877-1882); "Ancient Legends and Traditions Illustrating the Divine Comedy" (1865); "Essays Critical, Historical, and Literary" (1868); "Teaching History" (1869); "The School and the Social Question in Italy" (1872). He died in 1914.

VILLARS, CLAUDE LOUIS HECTOR, DUC DE, a French military officer; born in Moulins, France, May 8, 1653. He early distinguished himself under Turenne, Condé, and Luxembourg, and was created maréchal de camp in 1690, and lieutenant-general in 1693. In the wars of the Spanish succession he was sent to co-operate with the Elector of Bavaria. He defeated Prince Louis of Baden at Friedlingen, Oct. 14, 1702, for which he received the marshal's baton; and having joined the elector he defeated the Prince of Baden at Höchstadt, Sept. 21, 1703. His success in dealing with the insurrection of the Camisards obtained for him the title of duke (1705). Having been sent to defend the frontier against Marlborough, he forced the formidable lines of Stollhofen, near Strassburg, and penetrated far into Germany (1705-1707). In 1709 he replaced Vendôme in Flanders, and fought the battle of Malplaquet against Marlborough and Eugene, in which he was seriously wounded. In 1712 he defeated the allies at Denain, took Marchiennes, and relieved Landrecy. After the peace of Utrecht he opposed Eugene with uninterrupted success, and negotiated with him the peace of Rastadt, March 7, 1714. On the renewal of the war with Austria in 1733 he was sent to Italy at the head of an army, with the title of Marshal-General of France. After a successful campaign, he died in Turin, Italy, June 14, 1734.

VILLARSIA, a genus of plants of the natural order *Gentianaceæ*, the species of which are widely distributed over the world, and are either aquatic or marsh plants, with entire leaves and yellow flowers. *V.* (*Limnanthemum*) *nymphoides* is a native of England, but rare; it is more common in many parts of Europe, from Denmark to the Mediterranean, and is very abundant in Holland, often covering large tracts of the canals with its beautiful flowers and leaves. *V. indica* is regarded as a valuable medicine in India, being given internally to persons bitten by cobra. Several species from south Africa and Australia are cultivated in British aquariums for the beauty of their flowers.

VILLEHARDOUIN, GEOFFROI DE, a French chronicler; born in the family château near Bar-sur-Aube, about 1160. In 1180 he succeeded his father Guillaume as Marshal of Champagne under Thibaut, brother of Henri II. of France, and in 1201 he was one of the ambassadors despatched to Venice to make arrangements for the transport of the forces for the fourth crusade. On his return he found Thibaut dangerously ill,

and it was soon his duty to act as guardian of the rights of the widowed princess, Blanche of Navarre. Having concluded a treaty in her name with the king, Philippe Auguste, he departed for the East, where he distinguished himself greatly in the conflict which finally placed Baldwin of Flanders on the throne of the Byzantine empire. Rewarded by the monarch with extensive lands on the Hebrus, and appointed Marshal of Rumania, he repaid the favor by saving the crusaders from disastrous defeat near Adrianople in 1205. On his death in 1213 his nephew Geoffroi inherited his title and possessions. The narrative of the fourth crusade by which Villehardouin ranks among the most important historians of the time, covers the period from 1198-1207, and consists largely of his own personal experience. First published by Blaise de Viginère as "History of the Conquest of Constantinople by the French Barons, associated with the Venetians in the year 1204, in the Change of its Absolute Language to one more Modern and Intelligible" (1584), it has been frequently re-edited by Ducange (1657); by Petitot in his "Collections of Memoirs" (1819); by Bouquet in his "Things Gallic." "Scriptures" (1838); and by Natalis de Wailly (1st ed. 1871, 2d 1874). There is an English translation by T. Smith, "Chronicles concerning the Conquest of Constantinople" (1829), and a German translation by Todt (1878).

VILLEMAIN, ABEL FRANÇOIS, a French author; born in Paris, June 11, 1790. Educated at the Lycée Louis-le-Grand, he was at the age of 20 appointed assistant Professor of Rhetoric at the Lycée Charlemagne, and soon afterward professor at the Ecole Normale. In 1812 he gained the prize of the Academy for his "Eulogy of Montaigne"; on April 21, 1814, he read before the King of Prussia, the Czar Alexander, and the *élite* of Parisian society his essay "The Advantages and Inconveniences of the Critic," and two years after, he was crowned a third time for his "Eulogy of Montesquieu." Deputy for Evreux from July, 1829, he was made a peer of France in 1832, and from March 13, 1839, to March 1, 1840, was Minister of Public Instruction. Reappointed on Oct. 20, he was the leading promoter of the banishment of the Jesuits in 1844. About the end of that year ill-health forced him to forbear all mental labor, but in 1847 he had wholly recovered. After the establishment of the empire, Villemain resigned all his appointments save his place in the Academy, to which he had been elected in 1821. He died May 8, 1870.

VILLENA, ENRIQUE DE ARAGON, commonly styled MARQUES DE, a Spanish poet; born in 1384. He wrote: "The Troubadour's Art"; "The Art of Carving"; "The Labors of Hercules" (1483); "Treatises on Consolation"; "Fascinology" (on the evil eye); "On Leprosy." He also translated the Æneid and the "Divine Comedy." He died in Madrid, Spain, Dec. 15, 1434.

VILLENEUVE, PIERRE CHARLES JEAN BAPTISTE SILVESTRE DE, a French naval officer; born in 1763; entered the navy in 1777. He led the rear division at the battle of the Nile, and escaped with his own and four other ships to Malta. In 1804 he was made vice-admiral, and in 1805 Napoleon appointed him to the command of the Toulon squadron, with orders to divert the British fleet from the European coasts. He was eventually shut up in Cadiz by Nelson, but with the hope of repairing his ill success by a brilliant victory he sailed out of Cadiz, along with the Spanish fleet under Gravina, and offered the enemy battle off Cape Trafalgar. Villeneuve's flagship, the "Bucentaure," was captured, and the admiral taken as prisoner to England. In April, 1806, he was released and returned to France, but learning that his reception by the emperor would be unfavorable he committed suicide.

VILLEROI, FRANÇOIS DE NEUFVILLE, DUC DE, a French marshal; born April 7, 1644; was educated at court with Louis XIV.; but was banished to Lyons for a love affair. In 1680 he returned to court, and in 1693 became a marshal, having distinguished himself at Neerwinden. As commander in the Netherlands in 1695-1696 he showed great incapacity; and sent in chief command to Italy in 1701, he was there defeated and taken prisoner by Prince Eugene. Again he commanded in the Netherlands, but was defeated by Marlborough at Ramillies. Madame de Maintenon got him made guardian to Louis XV. Orleans sent him to live on his estate in 1722, because of his intrigues; but he was subsequently governor of Lyons, and died in Paris, July 18, 1730.

VILLIERS, CHARLES PELHAM, an English statesman; born Jan. 3, 1802; was graduated at St. John's College, Cambridge, in 1824; called to the bar in 1827; and elected to Parliament as a Free Trade Liberal in 1834. He represented his constituency for 63 years. In 1838, at the head of 38 Free Traders in Parliament, he led the movement for an investigation of the Corn Laws; in 1840 moved their repeal, and continued to

agitate the question year after year till the repeal act was finally passed in 1846. He was elected chairman of the Committee on Public Houses in 1853; opposed vested rights in licenses; brought forward in Parliament the question of postal reform; and was president of the Poor Law Board in 1859-1866. While holding the last office he was instrumental in the passage of the bill making unions chargeable for all the poor within their districts. He died in London, England, Jan. 16, 1898.

VILLIERS, FREDERIC, an English war correspondent and artist, born in London, in 1852. He was educated in France and studied art at the British Museum, the South Kensington schools, and the Royal Academy. His work as a war artist and correspondent began in 1876 in Serbia, and since then he has acted in a similar capacity for various publications in practically every war of any importance. He has also at various times represented publications as an artist and correspondent at important political events, such as the coronations of Czar Alexander III., Nicholas II., etc. He has also traveled and lectured extensively in many countries. Some of his paintings at various times have been exhibited at the Royal Academy and in other places, and he was the recipient of many war medals and other decorations. His publications include "Pictures of Many Wars" (1902); "Port Arthur" (1905); "Peaceful Personalities and Warriors Bold" (1907); etc.

VILLON, FRANÇOIS, true name probably FRANÇOIS MANTCORBIER, a French poet; born in Paris in 1431. He led a wild roving life, being imprisoned, pardoned, and finally banished from France. His poetry marks a new epoch in the introduction of a personal element. He wrote: "The Greater Testament" (1456), and the "Smaller Testament: Its Codicil" (1461), both in eight-line stanzas, with ballads and rondeaus interposed; a volume of "Ballades"; and a collection of poems in a jargon to-day unintelligible, "Jargon." He died about 1484.

VILMAR, AUGUST FRIEDRICH CHRISTIAN, a German theological writer; born in Solz in Lower Hesse. He was Professor of Lutheran Theology at Marburg, and a resolute opponent of rationalism in the theology. He wrote: "The Theology of Facts versus the Theology of Rhetoric" (1856); "History of German Civilization in Most Recent Times" (1858-1867); "A Little Handbook for the Friends of the German Folk-Song" (1867); "Exposition of the Augsburg Confession" (1870); "Moral Theology" (1871); "Dogmatic Theology" (1874); "History of German National Literature" (1845; 24th ed. 1894). He died in Marburg, Germany, July 30, 1868.

VILNA, or **WILNA**, a town of Lithuania; capital of the former province of the same name; on the Vilia. It is picturesquely situated, and contains numerous churches and convents. It has a governor's palace, a town hall, Greek and Roman Catholic cathedrals, and numerous educational establishments. There is a considerable trade in agricultural produce sent to Baltic ports. Pop. about 200,000. The city was captured by the Germans in 1915, and was the scene of military operations during the entire course. It was captured by the Poles in the campaign of 1920 against the Bolshevists, and its government was determined by a plebiscite.



FRANÇOIS VILLON

VINCENNES, a city and county-seat of Knox co., Ind.; on the Wabash river and on the Cleveland, Cincinnati, Chicago, and St. Louis, the Baltimore and Ohio South Western, and other railroads; 110 miles S. W. of Indianapolis. It is the entrepôt of a large agricultural region. Here are a court house, city hall, Vincennes University, the Harrison House, built by Governor Harrison in 1804; St. Francis Xavier Cathedral, an Orphan's Home, St. Vincent's Orphan Asylum for Boys (R. C.), several National banks, a number of daily, weekly, and monthly periodicals, street railroad and electric light plants, and waterworks. The city has machine shops, saw and grist mills, sewer pipe works, foundries, and manufactories of wagons, cement, stoves, tile, brick, plaster, wrapping paper, and various articles in tin, iron,

and wood. A French trading post was established here in 1710, and a colony in 1735, which lived peacefully with the Indians. Till 1813 Vincennes was the capital of the Northwest Territory. Pop. (1910) 14,895; (1920) 17,160.

VINCENT, GEORGE EDGAR, an American educator, born at Rockford, Ill., in 1864. He was educated at Yale University and at the University of Chicago, from which institutions, as well as from the University of Michigan, he received honorary degrees. After some years of editorial work and traveling, he became literary editor of the "Chautauqua Press" in 1886; vice-president of the Chautauqua System in 1888; president of the Chautauqua Institution in 1907 and honorary president in 1915. At the same time he was connected with the University of Chicago, from 1892 to 1911 as instructor, assistant professor, associate professor and professor of sociology, serving, also, from 1907 to 1911 as dean of the faculties of arts, literature, and science. From 1911 to 1917 he was president of the University of Minnesota, becoming, in the latter year, president of the Rockefeller Foundation. He was a member of the General Education Board and ex-president of the American Sociological Society and wrote "Social Mind and Education" (1896); "An Introduction to the Study of Society" (with A. W. Small, 1895).

VINCENT, ST., a Spanish martyr; born in Huesca, Spain; was imprisoned and tortured under Diocletian's reign, dying in Valencia in 304. His day is Jan. 22.

VINCENT DE PAUL, ST., a French philanthropist; born in Ranquines, France, April 24, 1577. After studying in a convent of the Cordeliers, he went to the University of Toulouse, and in 1600 was ordained priest. On a voyage from Marseilles to Narbonne, he was captured by pirates, and sent to Tunis, where he was kept in slavery for two years under three masters, the last of whom he converted to Christianity, and escaped with him to France, in 1607. He soon after settled in Paris, devoting himself to works of charity. He was named almoner to Margaret of Valois, held for a short time the curé of Clichy, and in 1613 became tutor to the sons of Philippe de Gondi, one of whom became afterward celebrated as the Cardinal de Retz. In 1616 he began those labors as missionary which occupied so large a part of his life, and the next year he founded the "Brotherhood of Charity," the model of so many others afterward established. His next great task was the reform of the condition of criminals condemned to the galleys; for which great service he was appointed almoner-general of the galleys. This unwearied philanthropist founded, in 1623, the Congregation of the Mission, which was constituted by royal letters patent, and approved by the Pope. In 1634 he instituted the order of "Sisters of Charity," the most widely known, perhaps, of all his foundations. He attended Louis XIII. on his death bed; was named by the Queen Regent Anne of Austria president of the Council of Conscience, took part in the controversy between the Jesuits and the Jansenists, against the latter; and died in the convent of the Lazarists, Sept. 27, 1660. He was canonized by Pope Clement XII., in 1737.

VINCENT OF BEAUVAIS, or **VINCENTIUS BELLOVACENSIS**, a mediæval encyclopedist; born about 1190. He was a Dominican friar. His voluminous works cover the whole field of mediæval science. The chief is "The Greater Mirror" (Speculum Majus), a vast encyclopædia of fables, science, literature, etc., in three huge volumes of 80 books and 9,885 chapters; it comprises Natural, Doctrinal, Historical; another part, Moral, is by another hand. Part i. (ed. 1473-1476) contains 848 folio pages, and treats of the whole visible world, and even of the Creator, angels, etc.; part ii., Doctrinal, is a summary of the scholastic philosophy, liberal and useful arts, government, grammar, arithmetic, theology, etc. The third part gives the Bible account of creation, the world's secular history down to Constantine, and histories of the German, Frank, English, and other nations. He died about 1264.

VINCENT OF LERINS, or **VINCENTIUS LERINENSIS**, an eccleciastical writer of the first half of the 5th century; was a native of Gaul and a monk of the monastery of Ledinum (an island, now St. Honorat), opposite Cannes. He was author of a "Warning against the Profane Novelties of all Heretics." In that work is for the first time laid down formally the test of Catholicity of doctrine, which is that the Catholic doctrine is "what everywhere, what always, what by all had been believed" (*quod ubique, quod semper*, and *quod ab omnibus creditum est*). He is by some critics believed to be also the author of a treatise favoring the heretical opinions of the Semipelagians, which is the subject of Prosper the Aquitanian's "Replies, on behalf of Augustine's Teaching, to the Heads of the Vincentian Objections."

VINCI, LEONARDO DA. See LEONARDO DA VINCI.

VINDHYA MOUNTAINS, a range of hills which extends across central India, almost due E. and W. from the plateau of Chota Nagpur, overhanging the basin of the Ganges, to the shore of the Arabian Sea in Gujerat. Their total length is about 500 miles, and the highest peak does not exceed 6,000 feet. The formation is granitic overlaid with sandstone. They form on the N. a continuous border to the Nerbudda, and with that river they are regarded as forming the traditional boundary between Hindustan proper on the N. and the Deccan on the S. The "fourfold girdle round the waist of India" is completed by the Satpura range and the Tapti river.

VINE, the *Vitis* of the botanist, is a genus of which there are a number of species; they are found over a wide range of the Northern Hemisphere, the majority in temperate Asia, as well as in North America, and a few are found in Europe. The genus belongs to the *vitæa* section of the order *Vitaceæ*. It has pentamerous flowers (five-toothed, five petals, and five stamens); the petals are attached to the disks at the base of the ovary, but, contrary to general rule, they adhere at the top and form a cap, which is thrown off by the stamens as they elongate and expand; the latter adhere for a time to the base of the fruit. All the species are furnished with claspers by which to lay hold for their support on any object within their reach. Some have leaves greatly lobed, others have been nearly plain.

The *V. vinifera*, the European wine-yielding grape vine, is that which has the greatest economic and commercial importance. It is found on the shores of the Caspian Sea, and it grows wild throughout the lower Caucasus and in Armenia. The cultivation of this plant has occupied much of man's time and attention in all nations that have attained to any degree of civilization, from the very dawn of history, and it is spreading more rapidly at the present time than ever it did at any previous one. The endless variety of grape vines in cultivation seems to indicate that the *V. vinifera* is not a true species, and this view is confirmed by the circumstance that seed taken from any variety of grape does not reproduce the parent, as it should do if it were an unbroken species, but one widely different, and as a rule very inferior to the parent, except in exceedingly rare instances, when a step in advance may take place. The writer has raised hundreds of vines from seeds taken from the finest grapes in cultivation, the rare exception being a variety equal or superior to the parent, and the rule being a reversion to a very inferior type; it is questionable if any of our high-class grapes are to be found in an uncultivated state in any part of the world. The plant has evidently been developed by the ingenuity of man at some very remote date, of which there is no record, just as our apples, plums, pears, peaches, and many other fruits and vegetables have been; and if man's constant care were withdrawn from their cultivation they would soon disappear from the earth, leaving it in possession of their wild progenitors.

By many Persia is thought to be the home of the grape vine, and excellent wine is still made there and exported. In European graves of the Bronze Age grape stones have been found, and in Greece and Italy the culture is primeval. The culture of wine on a commercial scale is dealt with in the article on wine, and in the articles on the wine growing countries. In Europe now the line of open-air culture of the vine on a large scale passes from the country just N. of the Loire in France through Belgium, central Germany, and Silesia; but in the Middle Ages wine was largely produced N. of this—in north France, Holland, and in England—either because the climate was warmer, or because consumers were content with poorer wine.

The cultivation of the grape vine was introduced into England by the Romans. At the date of the Norman Conquest there is evidence that the vine was pretty extensively cultivated in the S. and S. W. of England for the production of wine till about the middle of the 18th century, when for this purpose its cultivation was given up, and it was grown for dessert purposes against walls and dwelling houses with considerable success, and continues to be so grown up to this date. For this mode of cultivation the Royal Muscadine, Sweetwater, and Black Hamburg are among the most suitable. All the finer sorts of grapes, such as Frontignans, Muscats, Gros Colman, and many others of the higher classes of grapes, can only be cultivated in Great Britain in hothouses, and at the present date enormous quantities are so cultivated in Great Britain and the Channel Islands, some growers sending from 50 to 100 tons to market annually. This great supply depressed the price of grapes by more than one-half since 1882, very much to the public benefit, for it is now recognized that for man, whether in health or sickness, there is no more wholesome or grateful food than good grapes, acting as they do favorably on every organ of the body.

The soil most suitable for the vine in Great Britain is a good calcareous,

wheat soil. Turf taken from such land, stacked in narrow ridges for a winter, may be chopped down in the spring, and if clay is in excess, it should have burned clay or old lime rubbish mixed with it in the proportion of 1 to 10. The best manure for a vine border is one into which finely-ground bones, horn shavings, and other phosphatic manures enter, not forgetting potash. It is well to avoid stable manure, as that very frequently breeds fungi. On the other hand, cow manure sours the soil, and should also be avoided. An authority, while investigating the system of vine culture on the banks of the Rhine, found that growers there confined the cultivation to soil nearly all made up of the scoriæ and debris of the rocks, and avoided soil which in England was found most suitable; but the explanation was that, while the soils in question would grow grapes well, they did not yield wine of the desired bouquet.

The vine is easily propagated in a variety of ways—by layers, by cuttings, by eyes; also by budding, inarching and grafting, as well as by raising from seed. The common method of establishing vineyards for open-air cultivation in grape-growing lands—as in California—is to trench the soil where the land is hard, and to plant young canes at distances of from three to four feet apart, and four to five feet between rows, placing a stake to each young vine for its support. In the second year fruit can be produced, though it is better for the ultimate success of the vineyard not to crop till the third. Another method—more laborious and costly, and showing in greater ultimate advantage—is to put the vine cuttings in "nursery rows," to let them form roots there (as with gooseberry cuttings), and then transplant. Much of the labor required for growing grapes either in the open or under glass is devoted to pruning and training the plants. Various systems of pruning are in use, for securing greater vigor in the plant, to obtain more and better fruit, to keep up a constant supply of fruit-bearing wood, and to maintain the fruit-bearing portion, not on the extreme branches only, but near the ground. Nothing can well be less like the great vines grown under glass than the ordinary vine of a French or German vineyard, the vines being kept to some three or four feet in height, so that the uninitiated thinks rather of a raspberry garden than of a vineyard. In Italy greater luxuriance is allowed, and vines are even trained on trees pruned for the purpose.

In the United States, especially California, the development of viticulture has been great and rapid. Early attempts were made to grow foreign grapes in the open air, but none of these met with success E. of the Rocky Mountains. Till the Californian grape industry developed, the growing of foreign grapes in the United States was under glass, and for dessert purposes. Four native American vines (of some 10 found wild) are used for wine making, the most important being *V. Lambrusca.*

VINEGAR, a solution of acetic acid, usually containing from 2 to 5 per cent. of acid, and minute proportions of various ethers and other substances according to the sources whence it is derived. It is a product of the oxidation of alcoholic solutions, and may consequently be prepared from any body containing alcohol, or capable of being transformed into that substance. In practice it is prepared from malted barley or other grain (malt vinegar), from wine of inferior quality (wine, French or Orleans vinegar) from dilute solution of spirit (spirit vinegar) and from cider (cider vinegar). Wood vinegar, a product of the destructive distillation of wood, is used chiefly in connection with chemical operations, and though deficient in flavor, and other qualities it is in extensive use as a table vinegar, and for the various other purposes to which common vinegar is usually applied. The circumstances which are necessary for and favor the production of vinegar are, (1) an alcoholic solution (or a solution capable of developing alcohol) containing not more than 10 per cent. of spirit; (2) a suitable temperature, which may range from about 45° to 100° F.; (3) free access of atmospheric air; and, (4) the presence of substances which promote acetification or oxidation of the alcoholic solution, the chief active agency being the vinegar fungus *Mycoderma aceti,* which acts as a carrier of oxygen to the solution.

There are two principal processes by which ordinary vinegar is prepared, termed respectively (1) the old or slow process; and (2) the quick process. The slow process is still largely used in the preparation of French or wine vinegar, and it is also used in making British malt vinegar. In the manufacture of the latter there are a number of preliminary operations analogous to those employed in brewing. A mash of mixed malt and unmalted barley is prepared, and the wort is permitted to ferment. After completion of the fermentation the liquor is run into barrels, the tops of which are open but tied over with coarse canvas and stored away in darkened but moderately-heated chambers where there is free access of air. There the acetous fermentation takes place slowly during

several weeks or even months, when the contents of the barrels are emptied into two large tuns having false bottoms, over which the pressed cake from making currant wine, etc., is strewed. One of the tanks is filled entirely, but the second is only three-fourths filled. Here the acetous fermentation proceeds vigorously, and when the vinegar is ready a portion is drawn from the second (unfilled) tun. The quantity withdrawn is made up from the full tun, and it again is filled up from the barrels. In this way the manufacture goes on progressively. The old or slow method of vinegar making is a system requiring extensive premises and plant, and to a large extent it is now supplanted by the new or quick process.

The principle on which the various quick methods in operation depend consists in exposing the alcoholic solution at a favorable temperature in the most intimate manner to the action of the atmosphere. The solution is made to trickle drop by drop through one or more columns containing beech shavings or other means of fully exposing the fluid to the air, and as it descends it meets a current of air ascending. In this way rapid and complete oxidation is promoted. Vinegar on domestic scale is prepared from saccharine solutions to which the vinegar fungus *Mycoderma aceti* is added, the solution being covered up and kept in a warm place till the acetification is complete. The use of vinegar in the manufacture of pickles, the preparation of salads, and of acid beverages, as well as directly as a sauce with animal food, is very extensive. It is also an important substance in medicine, both for internal and external use, and its pungency combines in a very refreshing manner with various perfumes for toilet purposes. Vinegar is a valuable aid to the digestion of the hard fibrinous and albuminous constituents of food. The qualities of vinegar depend principally on the source whence it is obtained, the best being wine vinegar, after which comes that prepared from pure malt. Inferior vinegar is frequently contaminated with sulphuric acid, of which by law one part per thousand is permitted to be present without being counted an adulteration.

VINEGAR BIBLE, a Bible printed 1717 at the Clarendon Press in Oxford. So named because in the running headline of Luke xxii. vineyard was misprinted vinegar.

VINELAND, a borough in Cumberland co., N. J.; on the West Jersey and the Central of New Jersey railroads; 12 miles E. of Bridgeton. It is built on a level and sandy tract in a notable fruit-growing region. Here are numerous churches, hotels, a high school, public library, National and State banks, and several daily, weekly and monthly periodicals. The borough has machine shops, flour mills, and manufactories of shoes, carriages, fruit crates, buttons, gloves, clothing, paper boxes, linoleum, chenille curtains, carriages, plows and Smyrna rugs. Pop. (1910) 5,282; (1920) 6,779.

VINET, ALEXANDRE RODOLPHE, a Swiss theologian; born in the Vaud, Switzerland, June 17, 1797. In 1817 he was appointed Professor of the French Language and Literature at the Basel Gymnasium, in 1835 at the Basel University, and in 1837 accepted the chair of theology in the academy at Lausanne. In 1840 he seceded from the National Church, maintaining that there should be no connection between Church and State. His views on this subject were enforced in his "Essay on the Manifestation of Religious Convictions, and on the Separation of Church and State" (1842). In 1845 he gave up his chair. He was an earnest and eloquent preacher, and wrote "History of French Literature in the 18th Century"; "Studies of French Literature in the 19th Century"; etc. He died in Clarens, on Lake Geneva, May 4, 1847.

VINGT-ET-UN, a game of cards, the aim in which is to get as near as possible to the value of 21 (hence the name) without exceeding it. The game is played with the whole pack, the ordinary cards being reckoned according to the number of pips on them, while the court-cards are 10 and the ace is 1 or 11, as the holder may elect.

VINLAND, the name given to the chief settlement of the early Norsemen in North America. It is undoubtedly represented in modern times by part of Massachusetts and Rhode Island. The first that saw it was Bjarne Herjulfson, who was driven thither by a storm in the summer of A. D. 986, when making a voyage from Iceland to Greenland, of which country his father, Herjulf, and Eric the Red, were the earliest colonists. But Bjarne did not touch the land, which was first visited by Leif the Lucky, a son of Eric the Red, about A. D. 1000. One part of the country he named Helluland ("Stoneland"); another Markland ("Woodland"), the modern Newfoundland and Nova Scotia; a German in his company having found the grape (most probably the *Vitus vulpina*) growing wild, as in his native country, Leif called the region Vinland. The natives from their dwarfish size they called skraelings. Two years after Leif's brother, Thorwald, arrived, and in the summer of

1003 led an expedition along the coast of New England S., but was killed the year following in an encounter with the natives. The most famous of the Norse explorers, however, was Thorfinn Karlsefne, an Icelander, who had married Gudrid, widow of Thorstein, a son of Eric the Red, and who in 1007 sailed from Greenland to Vinland with a crew of 160 men, where he remained for three years, and then returned, after which no further attempts at colonization were made. Rafn, in his "Antiquitates Americanæ," published the first full collection of the evidence which proves the pre-Columbian colonization of America. Both he and Finn Magnusen labor to show that Columbus derived his first hints of a new world from the accounts of these old Icelandic expeditions. Finn Magnusen is believed to have established the fact that Columbus did visit Iceland in 1477, 15 years before he undertook his expedition across the Atlantic, and so may have heard something of the long-abandoned Vinland.

VINNITZA, a town of Russia, in the province of Podolia; on the Bug river; 245 miles N. N. W. of Odessa. It has several churches and synagogues, a Russo-Greek monastery, a Capuchin monastery, several schools, and a military hospital (formerly a Jesuit college). Pop. about 50,000.

VIOL, in music, a stringed instrument a little larger than the violin; it was furnished with five or six strings, had a fretted finger board, and was played with a bow. The viol is found depicted in MSS. as early as the 11th century. In France, Germany, and Italy the number of the strings varied between three and six. It is supposed that they were tuned in fourths and thirds. A chest of viols consisted of six instruments of various sizes, the smaller ones were called treble, the next mean, and the larger bass viols. The treble viol was somewhat larger than the violin, and the music for it was written in the treble clef; the mean (or tenor) viol was about the same length and breadth as the modern tenor violin, but was thicker in the body; its music was written in the c clef. The bass viol was much about the same size as the violoncello, and the music for it was written in the bass clef.

VIOLET, in botany, the typical genus of *Violaceæ*. Low herbs, more rarely shrubs, with radical or alternate leaves or flowers; on one, rarely on two-flowered peduncles; calyx of five sepals, extended at the base; petals five, unequal, the under one spurred at the base; anthers connate, two of them spurred behind; capsule of three elastic valves; seeds ovoid or globose. Known species 100; from temperate countries. Five of the most familiar are native in temperate Europe and America: *Viola palustris*, the marsh; *V. odorata*, the sweet; *V. hirta*, the hairy; *V. canina*, Gerard's or the dog violet; and *V. tricolor*, the pansy violet, pansy, or heart's-ease. The first has a subterranean creeping rootstock, glabrous stems, reniform cordate leaves, and white or lilac scentless flowers. The second has broadly cordate leaves, and fragrant blue, white, or reddish purple flowers; found in woods, pastures, or on banks. The third, with faintly scented flowers, is found chiefly in the E. of England and Scotland, and parts of North America. The fourth, with broadly cordate leaves, ciliate dentate stipules, and blue, lilac, gray, or white flowers, is common in woods, dry pastures, clefts of rocks, and banks; and the fifth, having flowers variegated, purple, white, and yellow, is frequent on banks and in fields. The bruised leaves of *V. tricolor* smell like peach kernels; they were once believed to be efficacious in the cure of skin diseases. The petals of *V. odorata* are used as a laxative for children. The seeds have similar qualities, and the root is emetic and purgative. *V. ovata* is a reputed antidote to the poison of the rattlesnake. *V. serpens*, a small procumbent, Himalayan herb, yields an oil. The flowers are considered diaphoretic and laxative, the seeds diuretic and emetic.

VIOLIN (diminutive from viol), the smallest but most important of the stringed musical instruments played with the bow. Like other bow instruments now in use, it consists of a wooden sonorous chest, formed of two slightly arched surfaces, known as the back and belly, united by sides or ribs, and with a curve or hollow on each side in the middle of the length; a neck or finger-board attached to the chest; and strings fastened at one end to the belly by a tail-piece or projection of wood, and at the other by turning pins at the head or extremity of the neck, by which they can be tightened or loosened at pleasure. The strings thus passing over the belly are raised up from it by a bridge, which is supported in the interior by the sound post; and on the belly there are two sound-holes opposite each other, of a form resembling the letter *f*, or rather the long *f*. The sounds are produced by drawing a bow across the strings, the upper surface of the bridge being convexly curved, so as to enable the bow to be drawn along each string separately, without coming in contact with the rest.

The modern violin has four strings of gut, the lowest covered with fine silvered copper wire, or sometimes, in the best instruments, with silver or even gold wire. These strings are tuned in fifths, the highest or first string sounding E on the fourth space of the treble clef, and the other three the A, D, and G in succession below. The bow, made of horsehair, is held in the right hand, and the sounds of each string, other than the open notes, are obtained by stopping—*i. e.*, pressing it with the finger against the fingerboard at certain distances, thus shortening the vibrating portion, and raising the pitch of the sound. Very high notes are produced by the harmonics of the string, which, instead of being pressed against the fingerboard, is touched lightly, the sound resulting from the vibration being not, as in ordinary cases, of the part of the string between the point of stopping and the bridge, but of a harmonic section of it. A peculiar modification of tone is produced by the application of the mute, or sordino, a little instrument placed on the bridge. A violin or other bow instrument is occasionally played pizzicato—*i. e.*, with the fingers, as a harp or guitar. The compass of the violin is about three octaves and a half, from G below the treble clef to C above the fifth leger line above it, with all the intermediate chromatic intervals; but the highest notes are apt to be harsh and squeaking. Great players command a few notes higher, chiefly by harmonics. Though chiefly an instrument of melody, it is to a limited extent capable of harmony by double stops—two notes may be struck together, and three or four notes may be played in arpeggio. No instrument can compare with the violin in power of expression and execution. It has an unlimited command over a very wide range of sounds, to which any degree of piano and forte, of staccato and legato, can be imparted. In orchestral music there are always two different violin parts known as first, and second violin (see ORCHESTRA); and the same is generally the case when the violin is used in concerted music, the usual arrangement of stringed quartet music being for two violins, viola, and violoncello.

The origin of the violin has been variously traced. The generally accepted view derives it from the one-stringed ravanastron, the simplest of the numerous Oriental stringed instruments played with a bow, which is traditionally the invention of Ravana, King of Ceylon, 5000 B. C., and is still played by Buddhist begging monks. From India these instruments of varied form found their way, through Persia, Arabia, and Spain, to the rest of Europe about the close of the 11th century. The French *rebeck*, resembling the Oriental *rebab*, is the type of them, and from it sprang the viol, the immediate precursor of the violin. Another account derives the violin from the classic lyre, as well as the *crwth* of the Welsh, which was latterly played with a bow. It is not impossible that both theories may be correct. The bow has not been conclusively accounted for, being variously supposed to have been primarily a military bow, a plectrum, and a second monochord lute applied to the first. The earliest violins seem to have been those of Gasparo di Salò in Lombardy (1560-1610), one of whose violins at one time belonged to Ole Bull. Those of Maggini, probably his pupil, are still highly prized. During the 17th century the family of the Amati, at Cremona, including Andrew, his sons Jerome and Antonio, and Nicolo, son to Jerome, produced violins the wonder of succeeding times, whose tone and quality more recent makers have in vain sought to equal. Antonio Stradivari (1649-1737), also of Cremona, pupil of Nicolo, if possible surpassed the Amati, and for a time the repute of Cremona was kept up by the families of the Guarnieri and Ruggieri. Next to the Cremonese violins, in the estimation of connoisseurs, stand those of the Tyrolese makers, Jakob Stainer (1621-1683), and Matthias Klotz and his sons. Villaume of Paris and Gemunde (father and son) of New York City were the most celebrated modern makers. Experience has shown that the minutest details of form and proportion, and the material of which each separate part is made, are matters of vital importance to the quality of the violin. The great makers seem by a succession of delicate experiments and observations to have attained to acoustical qualities of high perfection, which their careful workmanship and extreme dexterity enabled them in all cases unfailingly to reproduce.

VIOLLET-LE-DUC EUGÈNE EMMANUEL, a French historian of art; born in Paris, Jan. 27, 1814. He made profound study of mediæval architecture in Italy and southern France; and became professor in the École des Beaux Arts, 1863. His great work is "Dictionary of French Architecture from the 11th to the 16th Century" (10 vols. 1854-1869). His other chief works are: "Essay on the Military Architecture of the Middle Ages" (1854); "Dictionary of French House Furniture from the Carlovingian Epoch to the Renaissance" (6 vols. 1854-1875); "Discourses on Architecture" (2 vols. 1858-1872); "Chapels of

Notre Dame de Paris" (1867-1869); "Memoir on the Defense of Paris" (1872); "History of a House," "History of a Fortress," "History of Human Dwelling Places," "History of a City Mansion and of a Cathedral" (4 vols. 1873-1878). He died Sept. 17, 1879.

VIOLONCELLO, a bow instrument of the viol class, held by the performer between the legs, and filling a place between the viola and the double-bass. It is strung with four gut strings, the lower two covered with silver wire, and tuned in fifths. The compass usually employed extends from C on the second leger line below the bass staff to A on the second space of the treble, though soloists play an octave higher, with all the intermediate semitones.

VIPER, a genus of venomous snakes, representative of the family *Viperidæ*. This family includes many important forms—*e. g.*, the common adder (*Vipera* or *Pelias berus*); the asp (*V. aspis*), extending as far N. as Sweden; the African horned viper (*V. cerastes*) and puff adder (*Clotho* or *Echidna arietans*); the Indian daboia or Russell's viper (*Daboia russellii*); and the Indian *Echis carinata*. The head is relatively broad, somewhat triangular, and generally covered with scales; the eye has a vertical pupil, and there is no pit between it and the nostril; the maxilla bears on each side one functional fang, usually with several reserve fangs beside it; the poison is virulent. The vipers are widely distributed through Europe and Australia; the majority are African. As far as is known they are viviparous.

The common viper or adder is the only poisonous snake indigenous to Great Britain. It lives especially on dry heaths and waste places, often among stones and brushwood; it is commoner in Scotland than in England, and does not occur in Ireland. It is widely distributed throughout Europe. Often confused with the innocent grass snake (*Tropedonotus natrix*), it may be distinguished by its markings. It has two diverging marks between and rather behind the eyes, a spot on each side of the hinder part of the head, a row of confluent rhomboidal spots running zigzag along the upper surface of the whole length of the body and tail, and a row of small irregular, almost black, triangular spots on each side. The under parts are of a lead color. The characteristic markings are almost invariable, but the ground color varies considerably, from nearly olive, rich deep brown, or brownish-yellow, to almost black. Thus in some parts of England a black viper is occasionally met with; its ground color a rich black, and the markings of a more intense black than the rest. There is also the "red" and the "blue-bellied," and an almost white viper, with black markings. The viper seldom exceeds two feet in length. It feeds on mice, frogs, small birds, and other small animals, which are killed by its poison fangs, and swallowed entire. It hibernates during several months of the year, and several may then be found twined together in a torpid state. It is a good swimmer, and may occasionally be seen on lakes, such as Loch Lomond, crossing from one island to another. The young are produced in early summer, from 10 to 15 or more at a birth. The eggs have soft, thin envelopes, and are hatched within the oviduct. The young viper is coiled up so closely in the egg as to appear almost a solid mass, but the moment it is set free it is active, and ready to throw itself at once into an attitude of defense.

VIRCHOW, RUDOLF, a German pathologist; born in Schivelbein, Pomerania, Oct. 13, 1821; studied medicine at Berlin; and early became famous as a lecturer on pathological anatomy at Berlin University. His advanced liberal opinions during the movement of 1848 induced the government to deprive him (temporarily) of his appointment. In 1849 he accepted a chair at Würzburg, where he remained seven years, returning to Berlin in the autumn of 1856 as professor in the university and director of the pathological institute attached to it. He rendered immense service to medical science by his discoveries in regard to inflammation, ulceration, tuberculosis, and numerous other morbid processes of the human body, and has had great influence on the whole of modern medicine, including hospital reform and sanitary science. In 1862 he was chosen deputy to the Prussian Diet, and became one of Bismarck's most powerful opponents in the Prussian Parliament and Reichstag, and a member of important commissions, etc. He was one of the founders of the German Anthropological Society, and an enthusiastic worker in this field, accumulating facts (partly in company with Schliemann) in Asia Minor, the Caucasus, Egypt and Nubia, etc. He was a voluminous writer, and among his important works are: "Cellular Pathology" (4th ed. 1871, translated into various languages); "Handbook of Special Pathology and Therapeutics"; "Typhoid"; "The Natural Sciences in the New National Life of Germany"; "The Freedom of Science in the Modern State." He died at Berlin, Sept. 5, 1902.

VIRGINAL, a stringed instrument played by means of a keyboard, like the modern pianoforte. It was in form like a box, or desk of wood without legs or supports, and was usually placed on a table or stand. The strings were of metal, one for each note, and the sound was made by means of pieces of quill, whalebone, leather, or occasionally elastic metal, attached to slips of wood called "jacks," which were provided with metal springs. The compass was about three octaves. The virginal was a kind of oblong spinet, and the precursor of the harpsichord, now superseded by the pianoforte. The form *virginals*, a pair of *virginals*, is an old dual (as in *organs, regals*, a pair of *organs*) signifying a graduation or sequence.

VIRGINIA, a State in the South Atlantic Division of the North American Union; bounded by Maryland, North Carolina, Tennessee, Kentucky, West Virginia, and the Atlantic Ocean; one of the original 13 States; counties, 100; area 42,627 square miles; pop. (1890) 1,655,980; (1900) 1,854,184; (1910) 2,061,612; (1920) 2,309,187. Capital, Richmond.

Topography.—The surface of the State is diversified, rising in a series of terraces from the coast to the mountains in the N. W. Tide-water Virginia is penetrated by the Chesapeake Bay and has a shore line of 1,500 miles. The middle section of the State is an undulating plain with an elevation of from 200 to 500 feet and extends to the foot hills of the Appalachian range. The W. part of the State is mountainous, the Blue Ridge and Piedmont ranges crossing the State in a S. W. direction, and the Alleghenies forming the boundary of West Virginia. The valley section is a broad belt of rolling country diversified by hills, ridges, and river valleys, lying between the Blue Ridge and Allegheny Mountains. This region contains the valleys of the Shenandoah, Roanoke, James, Kanawha, and Holston rivers. The most important rivers are the Potomac, separating Virginia from Maryland, navigable as far as Alexandria; and the James, with its extensive network of tributaries, navigable to Richmond. Both of these rivers empty into Chesapeake Bay.

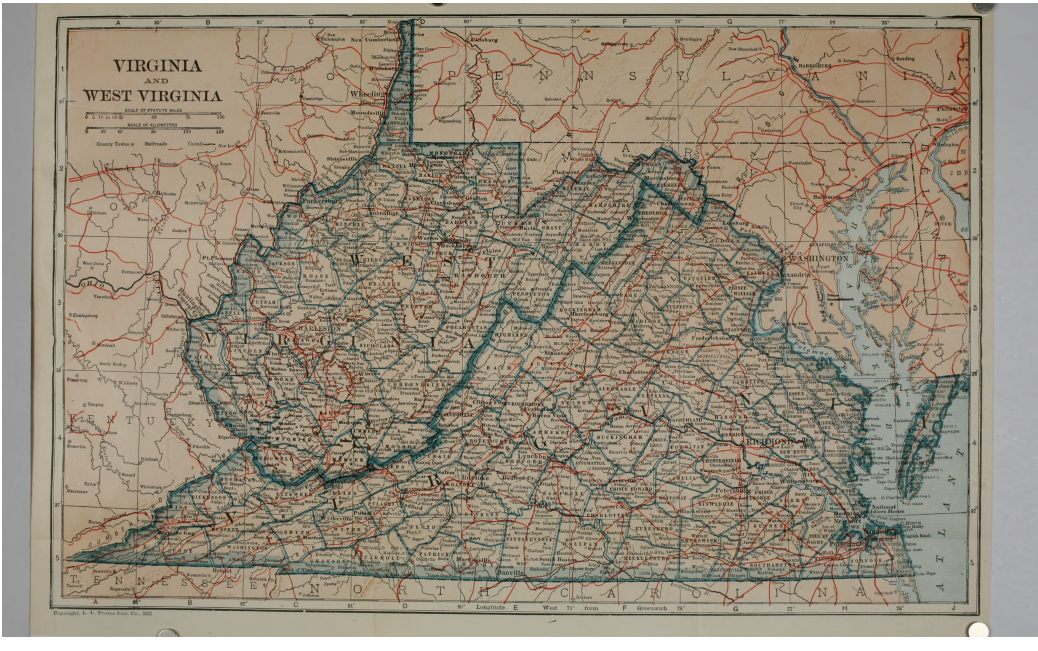
Geology and Mineralogy.—The coast is of Tertiary formation, consisting of sands, clays and marls, while further inland Miocene strata occur and abut against granite, gneiss and other metamorphic rocks. This metamorphic belt contains deposits of gold and iron. Two secondary belts cross the State parallel to the Blue Ridge and contain extensive coal measures. The valley is of Lower Silurian formation. The coal production in 1919 was 9,500,000 tons, which was 790,000 less than that of the previous year. Other important mineral products are granite, lime, clay, pig iron, manganese, talc, and soapstone.

Soil and Agriculture.—The soil in the tide-water region is light and sandy and though nearly worn out by superficial cultivation still yields large crops of vegetables. The soils of the Piedmont, Blue Ridge, and Valley regions are especially fertile, and together with the abundant rainfall, short, mild winters, and long summers make Virginia a great agricultural State. The acreage, value and production of the principal crops in 1919 were as follows: Corn, 1,600,000 acres, production 44,800,000 bushels, value $75,712,000; oats, 240,000 acres, production 5,280,000 bushels, value $5,280,000; wheat, 1,060,000 acres, production 12,508,000 bushels, value $28,018,000; rye, 72,000 acres, production 828,000 bushels, value $1,408,000; tobacco, 230,000 acres, production 131,130,000 pounds, value $62,141,000; hay, 1,000,000 acres, production 1,650,000 tons, value $39,105,000; peanuts, 139,000 acres, production 5,282,000 bushels, value $14,420,000; potatoes, 121,000 acres, production 11,495,000 bushels, value $18,047,000; sweet potatoes, 38,000 acres, production 4,750,000 bushels, value $7,362,000; cotton, 42,000 acres, production 22,000 bales, value $3,850,000.

Manufactures.—There were in 1914 5,508 manufacturing establishments, employing 102,820 wage earners. The capital invested amounted to $261,501,000; wages paid, to $44,874,000; value of materials used, $155,319,000; and value of finished product, $264,039,000.

Education.—The school population in 1918 was 658,926, of which 222,413 were negroes. The enrollment of white pupils was 348,918; and of negroes, 132,316. The average daily attendance of white pupils was 234,725; and of negroes, 82,631. There were 10,994 white teachers and 2,910 negro teachers. The total expenditure for education during that year amounted to $9,155,363. Education is free and compulsory for illiterate children between the ages of 8 and 12. There are seven normal schools, and the following colleges: William and Mary, at Williamsburg; Washington and Lee, at Lexington; University of Virginia, at Charlottesville; Virginia Union University, at Richmond; Virginia Polytechnic Institute, at Blacksburg; Virginia Military Institute, at Lexington; and the Hampton-Sidney College, at Hampton-Sidney.

Finances.—The receipts for the fiscal year 1919 amounted to $13,035,622, and the expenditures to $12,651,785. The


VIRGINIA
AND
WEST VIRGINIA
PENNSYLVANIA
WASHINGTON
RICHMOND
TENNESSEE
NORTH CAROLINA
Longitude E West 75° from Greenwich 76°

public debt amounted to $22,912,215. The total valuation of property was $1,270,149,000.

Charities and Corrections.—The institutions controlled by the State include the Penitentiary, at Richmond; State Farm, at Lassiter; hospitals at Williamsburg, Marion, and Staunton; Epileptic colony and Colony for Feeble-minded, at Madison Heights; Sanatorium for Incipient Tuberculosis, at Catawba; Sanatorium for Negroes, at Burkeville; School for the Deaf and Blind, at Staunton; School for Colored Deaf and Blind, at Newport News; Laurel Industrial School, at School P. O.; Industrial Home School for Wayward Colored Girls, at Peaks Turnout; Home and Industrial School for Girls, at Bon Air; and Soldiers' Home, at Richmond.

Railways.—There are about 4,800 miles of steam railway in the State.

Banking.—On Oct. 31, 1919, there were reported 154 National banks in operation, having $23,199,000 in capital; $16,826,000 in outstanding circulation; and $59,530,000 in United States bonds. There were also 295 State banks, with $17,564,000 capital, and $9,844,000 surplus. The exchanges at the United States clearing house at Richmond, during the year ending Sept. 30, 1919, aggregated $2,784,234,000, an increase over those of the preceding year of $633,437,000.

Churches.—The strongest denominations in the State are the Regular Baptist, Colored; Methodist Episcopal, South; Regular Baptist, South; African Methodist; Presbyterian, South; Protestant Episcopal; Methodist Episcopal; Disciples of Christ; Roman Catholic; Lutheran, General Synod; Primitive Baptists; Dunkard, and Christian.

State Government.—The Governor is elected for a term of four years. Legislative sessions are held biennially in odd years, beginning on the first Wednesday in January, and are limited in length to 90 days each, but may be extended for a period not exceeding 30 days, upon a three-fifths vote of both houses. The Legislature has 40 members in the Senate and 100 in the House. There are 10 Representatives in Congress.

History.—The first settlement in Virginia was made at Jamestown, by the English in 1607. The London company was reorganized in 1609 and received an extensive territorial grant. After passing through the starving time, and being saved from destruction through the efforts of John Smith the colony became very prosperous. In 1621 a legislature was formed, and in 1676 there occurred Bacon's rebellion brought on by the tyranny of Sir William Berkeley, the royal governor. George Washington first became known during the French and Indian War, in 1754, as an officer in the Virginia militia. This colony, under the head of Patrick Henry, was the first to resent British oppression in 1764. During the Revolution several important engagements took place on Virginian soil, most notable being the defeat and surrender of Cornwallis at Yorktown, Oct. 19, 1781. Virginia joined the Confederacy and passed an ordinance of secession on April 17, 1861, and became the scene of some of the most important battles of the Civil War, among them being the two battles of Bull Run, Winchester, Fredericksburg, Chancellorsville, the Peninsular campaign, and the battles of the Wilderness campaign; ending in the final surrender of Gen. Robert E. Lee at Appomattox Court House, April 9, 1865. Virginia was readmitted to the Union Jan. 27, 1870, and in 1881 celebrated the 100th anniversary of the surrender at Yorktown by laying the corner stone of a national monument, Oct. 18, 1881. During the American-Spanish War in 1898, an extensive military camp was established at Camp Alger, near Falls Church, in this State.

VIRGINIA, a city of Minnesota, in St. Louis co., about 75 miles N. W. of Duluth, on the Great Northern, the Duluth and Iron Range, and other railroads. There are flour mills, and a Carnegie library. Its prosperity and growth are based chiefly on the fact that it is the center of an important and prosperous iron mining and lumbering region. Pop. (1910) 10,473; (1920) 14,022.

VIRGINIA, the daughter of Lucius Virginius, whom Appius Claudius, the decemvir, endeavored to carry off from her parents. Her father, finding he could not save her by any other means, slew her in the open forum and raised an insurrection, which overthrew the decemvirate and restored the old magistracy. This happened, it is said, in 449 B. C.

VIRGINIA, UNIVERSITY OF, an educational non-sectarian institution in Charlottesville, Va.; founded in 1819; reported at the close of 1919: Professors and instructors, 88; students, 1,243. President, Edwin A. Alderman, LL. D.

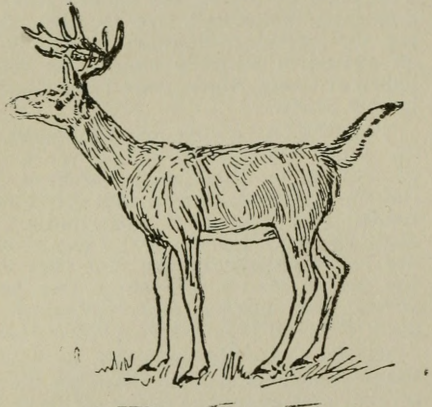
VIRGINIA CITY, a city and county-seat of Storey co., Nev.; on the Virginia and Truckee railroad; 15 miles N. N. E. of Carson City. It is built on the E. slope of Mt. Davidson at an elevation of 7,825 feet above sea-level. Here are public and private schools, a mining school, court house, St. Mary's Hospital, a county hospital, banks, and several newspapers. The city owes its growth to the famous Comstock mines, from which have been taken over $900,000,000

in gold bullion. The city has many ore smelting and refining plants built at considerable cost. Virginia City was settled in 1859, and was incorporated in 1861. Pop. (1910) 2,244; (1920) 1,200.

VIRGINIA CREEPER the *Ampelopsis hedercea*, a climbing plant, native to North America, used as an ornamental covering for walls, etc., and sometimes called American ivy. Its leaves turn a bright red in the autumn.

VIRGINIA MILITARY INSTITUTE, an educational non-sectarian institution in Lexington, Va.; founded in 1839; reported at the close of 1919: Professors and instructors, 34; students, 673.

VIRGINIAN DEER, the *Cervus virginiacus*, the common deer of North America. It is slightly smaller than the fallow deer; reddish-yellow in summer, light gray in winter; antlers recurvine;



VIRGINIA WHITE-TAILED DEER

tail about a foot and a half long. These deer are timid and wild, and therefore domesticated with difficulty. Their flesh formerly constituted the staple food of the native Indians.

VIRGINIAN EARED OWL, the *Bubo virginianus*, a large species common over the Northern States of the American Union. Length about two feet; reddish-brown on upper surface, mottled with black, and covered with regular bands of the same hue, lighter beneath; throat white; beak and claws black.

VIRGINIAN OPOSSUM, the *Didelphys virginianum*, the common opossum. It is about the size of a domestic cat; head long, large and pointed, ending in a naked snout. Hair long, soft, and woolly, whitish at the roots and brownish at the tips, giving the animal a dusky appearance.

VIRGINIAN QUAIL, the *Ortyx Virginiana*, a species of rasorial birds belonging to the family *Odontophorinæ*, and nearly allied to that of the partridges or *Perdicidæ*. In the genus *Ortyx* the edges of the beak are sinuous or wavy, and the wings have the third to the sixth quills longest. The outer toe is united to the inner at the base. The Virginian quail is also named the Virginian colin. It attains a length of 8 or 10 inches, and is of a reddish-brown hue, mingled with gray and black above, and yellowish white below. The head and breast are reddish brown and the chin pure white. The voice is clear, and the note resembles the words "bob-white"—a name often familiarly given to the bird. The Virginian quail feeds mostly on grains and inhabits open grounds, but in winter it approaches the habitations of man. The eggs may number as many as 24. The bird is trapped in great numbers in winter. Its flesh is highly esteemed.

VIRGIN ISLANDS, a group of small islands to the east of Porto Rico, part of which belong to the Leeward Islands, a British colony, and part to the United States. The American islands are St. Thomas, St. Croix, St. John, Vieques, and Quelebra. The three former, with 50 smaller ones, form the Danish West Indies. These were purchased by the United States from Denmark and were formally transferred on March 31, 1917. Payment of $25,000,000 was made for these islands. The islands belonging to the United States have a total area of 132 square miles, and a population of about 27,000. There are three cities, Charlotte Amalie, on the island of St. Thomas; Christiansted and Frederiksted on the island of St. Croix. Agriculture is the chief occupation of the inhabitants. The island of St. John is noted for its bay oil and St. Thomas for bay rum. The islands are administered by a rear-admiral of the United States Navy.

VIRGINIUS AFFAIR, THE. It was in the harbor of Santiago de Cuba that the historic "Virginius affair," occurred in 1873, which almost caused a war between the United States and Spain. The "Virginius," a ship registered in the New York custom house Sept. 26, 1870, as the property of an American citizen, was captured on the high seas near Jamaica, by the Spanish man-of-war "Tornado," Oct. 31, 1873. The reason given was that she was about to land men and arms in Cuba, which was then engaged in the "Ten Years' War" against Spain. At the time of capture the "Virginius" was flying the American flag. She was taken to Santiago. President Grant remonstrated with the Spanish Government,

and through the United States minister to Spain, General Daniel E. Sickles, demanded the release of the "Virginius" and her crew.

Spain was at that time a republic under President Castelar, and while his government was asking for time to obtain information and was making promises, the authorities in Cuba determined to take matters into their own hands. On Nov. 7, 1873, the captain of the "Virginius," Joseph Fry, and 36 of the crew, were shot. The next day 12 of the most prominent passengers were also shot. The Captain-General of Cuba, General De Rodas, directly sanctioned these murders. When the news of this action became known in the United States the excitement was intense. Meetings were held, and the bloody work was denounced. President Grant authorized the putting of the navy on a war footing, diplomatic relations were on the point of severance and war was imminent. Meanwhile President Castelar made the excuse that his orders to stay proceedings were received too late to prevent the crime.

Several times it seemed that hostilities could not be avoided. Once, General Sickles sent for a ship to take him from Spain. At last, however, on Nov. 29, a protocol was signed between Secretary Fish and Admiral Polo, by which Spain agreed to surrender the survivors of the crew and passengers of the "Virginius," together with the ship, and to salute the flag of the United States on Dec. 25. If, however, it should be proved in the interval that the "Virginius" had no right to fly the United States flag, the salute should be dispensed with, though Spain should disclaim any intention to insult the flag. Three days before the time agreed on, Secretary Fish announced himself as satisfied that the "Virginius" had no right to fly the flag, and the salute was dispensed with. On Jan. 23 Admiral Polo made the disclaimer agreed on. The "Virginius" was delivered to the United States navy at Bahia Honda on Dec. 16, with the American flag flying. She was, however, unseaworthy and, encountering a heavy storm off Cape Fear, sank. The prisoners who survived were surrendered on Dec. 18, at Santiago de Cuba, and landed in safety in New York.

VIRGO, in astronomy, the Virgin: (1) One of the 12 ancient zodiacal constellations. It is bounded on the N. by Boötes and Coma Berenices; on the S. by Corvus, Crater, and Hydra. Its principal star, Alpha Virginis, is called Spica Virginis, or simply Spica. It is in the hand of the imaginary virgin which holds ears of corn, typifying the harvest which took place in Greece while the sun passed through this part of the ecliptic. (2) The sixth sign of the zodiac. The sun enters it about Aug. 23, and leaves it about Sept. 23.

VIRIATHUS, the shepherd leader of the Lusitanians, or ancient inhabitants of Portugal, in their struggle for independence against the Romans; was one of the survivors of his countrymen's massacre by Sulpicius Galba (150 B. C.). Thenceforward he carried on in Lusitania and southern Hispania a successful guerrilla warfare against a succession of Roman proconsuls, winning two pitched battles, and in 141 entrapping the army of Quintus Fabius Servilianus in a mountain pass. Unconditional surrender was followed by alliance and a promise of independence; but within a year Servilius Cæpio, the next proconsul, again took the field, and bribing some Lusitanian envoys, procured the assassination of Viriathus (139), with whose death the conflict virtually ended.

VIRUS (Latin, "a poisonous fluid"), a term used in medicine to designate the *materies morbi* of zymotic diseases. It more specially designates those peculiar poisonous matters which can reproduce themselves under favoring conditions to an endless degree. The poison of the cobra is a specific virus which, when introduced into the human system, acts as a most virulent poison; but the poison is not multiplied within the human subject, and one person affected by the poison cannot communicate the disease to another. In like manner, morbid products from decaying vegetables under certain conditions of heat and moisture may possibly originate the virus of malarial fever; but the virus is not propagated within the human organism, or, at all events, never in such a form as to render it capable of producing the same disease in others. By some the virus of the contagious or infectious diseases is supposed to be a *contagium vivum seu animatum*, the theory being that the virus consists of living beings or low organisms. Such views have been advocated by Kircher, Lancisi, Vallisneri, Reaumur, Linné, Henle, Roberts, and others; and although the theory of a *contagium vivum* is not as yet complete, the discussion of it is the most important which has ever engaged the attention of medical men. The most prominent characteristic of each specific virus is that it can reproduce itself within the human organism, and to an unlimited extent, each virus preserving its own specificness. Experience and observation tend to confirm the hypothesis that

each specific disease breeds true, though, in the course of 1,000 years, it is possible that the changes within certain limits may take place, as is the case in animals and plants. The natural conclusion follows that diseases of this class do not originate spontaneously, but are propagated each from its own kind, though some contend that they do not originate, even in our own day, spontaneously or autochthonously. Another remarkable peculiarity belonging to many, but not to all, diseases propagated by a specific virus, is that a single attack of the disease successfully surmounted produces absolute or relative immunity for a certain length of time, or even for the remainder of life. See BACTERIA.

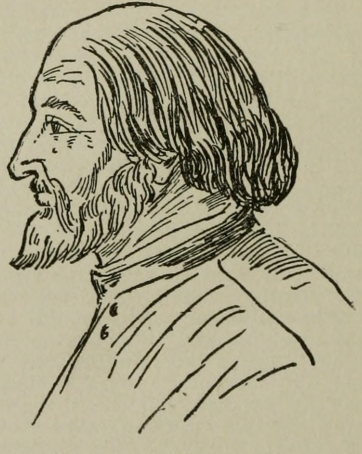
VISAYAS, THE, a group of islands which occupy the central part of the Philippine Archipelago, between Luzon on the N., Mindanao on the S., the Pacific Ocean on the E., and Paragua on the W. They lie between lat. 9° 2′ and 12° 39′ N., and between lon. 121° 48′ and 125° 50′ W.; area, 57,714 square kilometers; pop. about 3,500,000. The group may be divided into three parts, each including several adjacent islands. The principal islands of the first group are Romblon and Panay, of the second, Negros, Cebu, and Bohol, and of the third Samar and Leyte. Many of the islands are mountainous, but there are valleys and plains which are usually very fertile. Agriculture is quite extensively carried on. There are large crops of rice, sugar cane, subacao, coffee, chocolate, wheat, corn, tobacco, hemp, etc. The forests of the islands are generally rich in excellent building and cabinet woods, such as molave, ipil, banaba, durigon, alintatao, narra, etc. There is also found in the forests an abundance of pitch, resin, gum, mastic wax, and honey. Gold, silver, lead, coal, marble, etc., are mined to a greater or less extent in some of the islands. Manufacturing is carried on to a considerable extent. In the province of Antique, on the island of Panay, the manufacture of fabrics from pineapple fiber, jusi, and sinamay is flourishing. Hunting and fishing are also important industries.

VISCERA, in anatomy, the contents of the great cavities of the body, as of the skull, chest, and abdomen, but in popular language restricted to the organs of the thorax and abdomen; the bowels; the entrails.

VISCHER, PETER, a German sculptor; born in Nuremberg, Bavaria, in 1455, son of a worker in bronze. He attained great fame as an artist and received orders both from German and foreign princes. His most celebrated work is the tomb of St. Sebaldus in Nuremberg, which contains 72 figures, besides those of the apostles and prophets. He died in Nuremberg, Jan. 7, 1529.

VISCIN, a waxy substance, the principal constituent of bird-lime, extracted from the stalks, leaves, and berries of the mistletoe. It is clear, colorless, inodorous, and tasteless, insoluble in water, but slightly soluble in alcohol, has the consistency of honey at ordinary temperatures, but becomes more fluid at 30°. Heated to 100°, it is as fluid as almond oil.

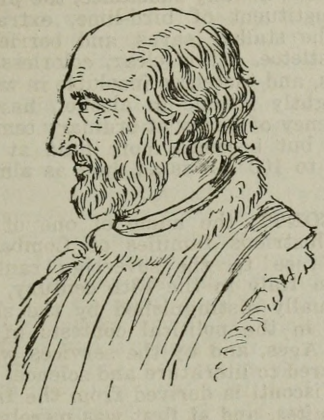
VISCONTI, the name of one of the most illustrious families of Lombardy, which rose to the sovereign rank in northern Italy in the 13th century, and was equally distinguished by the share it took in the political contests of the Middle Ages, and by the services which it rendered to literature and science. The name Visconti is derived from the Latin *vice-comites*, and at first was merely the title of an office, but it gradually became



GIOVANNI VISCONTI

a family surname, though when it came to be applied to this family authentic history fails to explain. The power of Visconti began in 1277, when Ottone Visconti, archbishop of Milan, vanquished his popular opponents headed by Martino della Torre, and became perpetual Lord of Milan. Two of the most important members of the family were Matteo, who was compelled to resign by Pope John XXII.; and Giovanni Galeazzo, who brought the power and grandeur of Visconti to its highest point. He founded the library at Paris; the Cathedral of Milan, etc.; and conquered Padua, Verona, Vicenza, etc. In 1441, Filippo-Maria Visconti engaged the serv-

ices of Francesco Sforza, to whom he gave his natural daughter Bianca in marriage; and on his death in 1447 the Visconti family was succeeded by that of Sforza in the lordship of the Milanese.



MATTEO VISCONTI

VISCONTI, ENNIO QUIRINO, an Italian archæologist; born in Rome, Italy, Nov. 1, 1751. In his 14th year he translated into Italian verse the "Hecuba" of Euripides. His greatest work is "Grecian Iconography" (3 vols. 1808). He visited London at the invitation of Lord Elgin to inspect the Elgin Marbles, 1817, and wrote "Memoirs on the Works of Sculpture from the Parthenon" (1818). He died Feb. 7, 1818.

VISCOSITY, stickiness; in physics, resistance of a fluid to relative change in its particles; capability of a solid to yield continually under stress.

VISCOUNT, a degree or title of nobility ranking next below an earl, and above a baron. It is the most recently established English title of nobility, having been first conferred by letters patent from Henry VI. on John Lord Beaumont, in A. D. 1440. The title of viscount is frequently held in England as the second title of an earl, and is borne by the eldest son as a courtesy title during the life of his father. The coronet of a viscount of England is composed of a circle of gold, chased, having on the edge 12, 14 or 16 pearls; the cap of crimson velvet, turned up with ermine, and closed at the top with a rich tassel of gold.

VISCUM, the mistletoe; a genus of *Loranthaceæ*. Leaves opposite, whorled, or wanting; flowers unisexual; males with the calyx obsolete; four petals; ovate, fleshy, united at the base, and bearing each a single anther, adnate with its upper surface. Fertile flowers, with a superior calyx having an obscure margin; four erect, ovate, very minute petals, and a sessile stigma. Known species believed to be about 100; from hot and temperate climates.

VISHNU, in Brahmanism, the second person of the modern Hindu Trimurti. When he first appears in Vedic times, he is simply the God of the Shining Firmament, the younger brother of Indra, and inferior to him in dignity. By the time that the epic poems, the Ramayana and the Mahabharat, were composed, Vishnu had made a considerable advance to his present position, the full attainment of which, however, was reserved for the period of the Puranas. One of these books is called the Vishnu Purana. He is regarded as the member of the triad whose special function is to preserve. To do this he nine times successively became incarnate, and will do so once more. The first time he appeared, it was as a fish to warn a righteous king, Manu, of an approaching deluge, and save the sacred Vedas from being lost. His second appearance was as a tortoise to support the world, while the gods and goddesses churned the sea; the third, as a boar, to lift up the submerged world on his tusks; the fourth, as a man-lion, to tear to pieces an impious king; the fifth, as a dwarf, to recover for the gods their supremacy lost by their neglect; the sixth, as Parasurama, to wash away the sins of the earth by the destruction of the Kshatriya race—probably an allusion to the historic fact that when the Aryan Brahman and Kshatriya warriors had well established themselves in India, jealousies arose between them, and the Kshatriyas were vanquished, and in large measure destroyed, by the Brahmans; the seventh, was as Rama, the hero of the Ramayana; the eighth, as Krishna; the ninth, as Buddha; and the tenth, as Kalki, or the White Horse, is still to come. When it arrives, Vishnu shall appear on a white horse, with a drawn sword, wherewith he shall destroy the wicked, and thus prepare the way for a renovated world. Vishnu himself is generally represented as a dark-blue man, with four arms, the first holding a war club, the second a conch shell, the third a quoit-like weapon called Chakra, and the fourth a water lily. His two most popular incarnations are as Rama and Krishna. His most enthusiastic followers are generally drawn from the middle classes of Hindu society. His mark on their foreheads is a trident, with a yellow fork in the center, and a white one on each side. Many monastic sects worship him almost exclusively.

VISIBLE SPEECH, the system of expressing speech sounds by written symbols, invented by Prof. Alexander Melville Bell during the years 1849-1864. Its fundamental principle is, says its author, "that all relations of sound are symbolized by relations of form, each organ and each mode of organic action having its appropriate symbol, and all sounds of the same nature produced at different parts of the mouth (such as *t* and *d*, *b* and *p*) being represented by a single symbol turned in a direction corresponding to the organic position." The shapes of these symbols not being founded on any existing alphabet, the system here can only be illustrated, in the absence of the peculiar fount, by two that bear an accidental likeness to our current letters—O, symbolizing that the throat is open, and C, that part of the mouth is contracted. Among the advantages claimed for visible speech by Professor Bell are its power of representing the exact sounds of foreign languages (even Zulu clicks), and the facilities offered by it toward teaching the illiterate and blind to read, and the deaf and dumb to speak. But though the first at least of these claims has been established by rigid tests, and is admitted by A. J. Ellis and other eminent phonologists, the system has not, as its inventor hoped, been taken up by the government. See Bell's "Visible Speech," "The Science of Universal Alphabetics" (London, 1867).

VISIGOTHS, the Western Goths, who came from Scandinavia, and settled in Mœsia, A. D. 376. They established themselves in Gaul A. D. 412, and, passing into Spain, founded a kingdom there in 414, which was overthrown by the Moors in 712. The names of the kings were:

Ataulfus..... to 414	Vitteric.....603-610
Wallia..... 415-418	Gundemar.....610-612
Theodores.....418- ?	Sisebut.....612-620
Theudis.....531-548	Recared II.....620-621
Theudisele....548-550	Suintella.....621-631
Agila (at Merida).....550-554	Sisenand.....631-636
Atharagild....556-567 (Toledo his capital)	Tulca.....636-642
Liuva (at Narbonne).....567-568	Chindasvindê..642-649
Leovigild.....568-586	Recesvinde....649-672
Recared.....586-601	Wamba.....672-680
Liuva II.....601-603	Ervige.....680-687
	Egiza.....687-701
	Witiza..... 701-710
	Roderic.....710-711

VISION, the act of seeing, that faculty of the mind by means of which, through its appropriate material organ, the eye, we perceive the visible appearances of the external world. Vision is mainly concerned with the color, form, distance, and tridimensional extension of objects. It is caused by impact of ether waves on the retina of the eye, but if these waves be longer or shorter than a certain limit, there is no visual impression produced by them. The apparent color of an object depends partly on the wave length or wave lengths of the incident light waves, single or mixed, and partly on the state of the eye itself, as in color blindness, or after taking santonine, which makes external objects look yellow, or in jaundice. The apparent brightness of an object depends on the amplitude of the light waves which pass from it to the eye; and the smallest perceptible difference of brightness always bears a nearly constant ratio to the full intensity of the bright objects (Fechner's psychophysical law). As between different colors the eye perceives them with different intensities, even when the physical intensity is the same; thus yellow appears brighter in a bright light than an equally intense red; and as light fades away the different colors fade away unequally, so that the ratio in Fechner's law is different for each color; red and yellow disappear first, blue last; and thus in a dim light the blue is the brightest.

The leading problems in the theory of vision are, however, those which deal with the nature of our perception of distance and of three-dimensional extension. According to Bishop Berkeley, whose views ("On the Theory of Vision") have met with the widest acceptance, we do not by means of sight perceive either that external objects are outside ourselves or their distance from us; but this knowledge is derived from touch and from our experience of motion from place to place; and as our experience is in general uniform, we come to associate the visible with the tangible so readily that we fancy we directly see visible objects. As regards the distance of any given point, Berkeley maintains that this cannot be seen, "for distance being a line directed endwise to the eye, it projects only one point in the fund of the eye; which point remains invariably the same, whether the distance be longer or shorter." This may be true, and yet the eye may be obliged to put forth perceptibly different efforts in order to discriminate points situated at different distances. Rays proceeding from the distant point form a cone, whose base is the pupil of the eye; and in order to make this divergent cone converge on a point in the retina a distinct effort of focussing or accommodation is necessary for each distance. That the distance may be judged by means of the necessary effort of accommodation may be seen by taking a small thin-edged lens, holding it at arm's length, and viewing distant objects through it. A small inverted image of the distant objects is seen; but on trying to ascertain at what distance this

image is situated, the necessary accommodation teaches us that it is situated beween the eye and the lens. The effort of accommodation appropriate to each distance is the same whether the rays have actually come from the apparent distant point or not, so long as they approach at a certain angle of divergence; hence rays from clouds reflected in still, turbid water, and continuing their divergence after reflection, approach the eye, and are dealt with by it, as if they had proceeded from a great depth below the surface of the water. Similarly the apparent depth of objects under water is diminished because the amount of divergence of the rays is altered by refraction; and the apparent distance of an object is increased by repeated reflection because after such repeated reflection the rays originally diverging from the object reach the eye diverging as if they had come from a more distant point, the virtual apex of the incomplete cone of ultimately reflected rays.

The axis of the double cone of rays, first divergent as it approaches the eye, and then convergent upon the retina within the eye, fixes the direction of the apparent position of the point (which may or may not be the real position, according to circumstances), and the strain to which the eye is subjected in accommodation measures the apparent distance in that direction.

On ordinary optical principles a point above the direct line of vision comes to a focus at a point of the retina below its center, and vice versa. If the retina could be looked at by another person it would be found that an image of the object is formed on the retina, and that this image is inverted. It has been much questioned how this inverted image can produce the sensation of direct vision. We may observe in the first place that the question is somewhat nugatory, since the individual never becomes directly aware of the inversion or, it may be, even of the existence of the physical image in his own retina; and secondly, that the individual has come strongly to associate, by experience, the top of an object with the act of looking up in order to see it, and vice versa. Any increase in the magnitude of the retinal image is generally associated with approach of the object, and in the exceptional cases in which this result can be brought about by means of lenses, even where the real distance is increased, the object seems to approach; this seeming to approach being the result of an unconscious process of reasoning. The mind, on the basis of tactile experience, interprets any given object as being of a known or ascertained size; if it comes to look larger, it is inferred that it has come nearer.

VISTULA, the largest river that flows into the Baltic; rises in the former Austrian Silesia on the N. slopes of the Bieskiden, and is formed by the union of the Black, the White, and the Little Vistulas (Biala, Molinka and Czorna). It flows N. to the village of Vistula, where it forms a waterfall 190 feet in height, then through a rocky valley to the town of Schwarzwasser, where it leaves the mountain land. Before the World War it separated Prussian Silesia from Austrian Silesia and Galicia, and after receiving the Przemza flows N. E., passing Cracow, and separating Galicia from Poland as far as Sandomir, where it receives the San, and turns N. N. W., then W., across the great plain of Poland, passing Warsaw, Nowo Georgiewsk, and Plock, and receiving the Pilica and Bug. Near Thorn it entered Prussia, and continues a N. W. course till it receives the Brahe below Bromberg, where it turns sharply N. N. E. At Montau, near Marienwerder, it divides into two branches, the smaller of which, called the Nogat, discharges into the Frisches Haff, while the larger or W. branch after flowing 40 miles farther, again divides at Fürstenwerder into two branches, the smaller or E. falling into the Frisches Haff, and the main branch turning W. and falling into the Baltic at Weichselmünde, 3 miles N. of Danzig. The total length of the Vistula is 630 miles. As a result of the World War the Vistula has become a river of Poland, flowing through Polish territory throughout its entire length, with the exception of about the last 50 miles, which flow partly through East Prussia and partly through territory belonging to Danzig.

VIT, VINCENZO DE, an Italian Latinist; born in Padua, Italy, in 1811. He was an ecclesiastic by profession, was a canon of Rovigo, and town librarian, when in 1850 he joined the brotherhood of Rosmini. On his jubilee in 1888 Leo XIII. sent him a gold medal. He edited Forcellini's "Complete Latin Lexicon" in six volumes, and wrote a supplemental seventh volume, giving in 1,000 pages in double columns all the words in recently discovered inscriptions or codices. His minor writings on history, archæology, and philology have been collected in a uniform edition published at Milan and Florence. His greatest original work is the "Onomasticon," or "Namebook," containing all proper names down to the 5th century. Thirty-six years' labor had just brought him to the end of O, clos-

ing the fourth volume, when he died, Aug. 17, 1892.

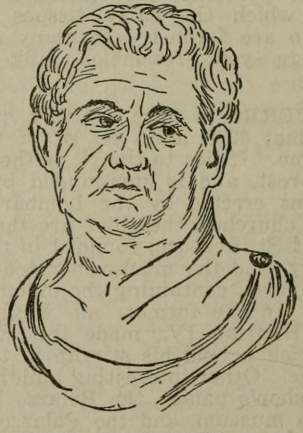
VITAMINES, nitrogenous bodies which occur in certain foodstuffs. They were first discovered in 1912 by Gowland Hopkins in milk, and although their exact chemical nature is still, to a large extent, a hidden mystery, their enormous importance in the process of nutrition is well recognized. Three distinct types of vitamines have been discovered, and all three must be present in food in order that proper growth of the animal body may take place and that certain diseases may be avoided. The three types are known as (1) Fat-soluble A, or growth-promoting vitamines; (2) Water-soluble B, or anti-neuritic vitamines; (3) Water-soluble C, or anti-scorbutic vitamines. Fat soluble A occurs in butter, in various animal oils, such as whale-oil and cod-liver oil, and in many vegetables, especially in spinach, but is not found in refined vegetable oils. For this reason, butter is preferable to vegetable margarines, especially for growing children. Water soluble B is found in the embryo of cereals, while one of the richest sources of this vitamine is yeast. Water-soluble C occurs in many fruits and vegetables, orange and lemon juices being especially rich sources. An immense amount of experimental work has been carried out to demonstrate the important rôle which vitamines play in the process of nutrition, of which the following are a few examples: E. Mellanby found that puppies fed on a diet deficient in fat-soluble A rapidly developed rickets, but when butter or cod-liver oil was added to their diet, the symptoms quickly disappeared. Pigeons and cats when deprived of water-soluble B develop polyneuritis, but rapidly recover when fed small quantities of yeast or extracts of yeast. A very striking illustration of the effect of water-soluble B occurred during the World War. In December, 1915, there was an outbreak of beriberi among the British troops in Mesopotamia, but among the Indian troops in the same region the disease was practically unknown. The theory was put forward that the difference was due to the fact that the British troops were fed highly refined white flour, while the Indian troops used a flour containing the germ and the aleurone layer. During 1916 the British troops were given a ration of yeast extract. In the following winter, instead of a second outbreak of beriberi, there were only a very few mild cases and not a single death. Many similar experiences have occurred. The Indian troops in France suffered severely, for a time, from scurvy, due to the fact that their diet lacked the water-soluble C, or anti-scorbutic vitamine. The addition of fresh limes to their diet resulted in a marked falling off of the disease.

VITEBSK, before the World War a province of western Russia, surrounded by Pskov, Smolensk, Mohilev, Minsk, Vilna, Courland, and Livonia; area, 16,983 square miles; pop. about 2,000,000. The surface is in general hilly; in the depressions are numerous marshes and more than 2,500 lakes, of which the largest are Lubahan, Rasno, Nevel, Sebesh and Osvea. The chief rivers are the Duna, Mesha, Kasplja, Ulla, Drissa and Evst. The soil is far from fertile, and the harvests, except under the most favorable conditions, are insufficient for the wants of the population. The principal occupations are agriculture, cattle rearing, hunting and fishing, besides tanning, weaving and the manufacture of brandy and tobacco. Flax, linseed, hides, building timber, and fancy wares are exported.

VITEBSK, capital of the province of Vitebsk, lies on both sides of the Duna, 79 miles N. W. of Smolensk. It has many churches, several synogogues, an old palace, a theater, a gymnasium, and a hospital, manufactures of mead and leather, and an active transit trade. Pop. about 120,000.

VITELLIN. See GLOBULIN.

VITELLIUS, AULUS, a Roman emperor; son of Lucius Vitellius, the consul (34); born A. D. 15. At that dark



AULUS VITELLIUS

period of Roman history vice and not virtue was the passport to royal favor, and the son like the father was a master of the arts of servile cringing and abject

flattery. To these he owed his rapid rise and his favor with Tiberius, Caius Caligula, Claudius and Nero. On the death of Galba he was proclaimed emperor by the soldiers at Köln, Jan. 2, A. D. 69, and having crushed his rival Otho he secured undisputed possession of Italy. Though undoubtedly a man of low character, he did not proceed to extreme measures against the adherents of his rival. His chief passion was sensual gluttony, and he spent enormous sums of money in eating and drinking. Vespasianus revolted, and was proclaimed emperor July 1 at Alexandria, and Antonius Primus declared for the new emperor and hastened into Italy at the head of a powerful force. He defeated the generals of Vitellius twice and entered Rome, Dec. 21 or 22, A. D. 69. The fallen emperor was seized, dragged with every mark of ignominy through the streets and murdered.

VITELLUS, or **YOLK**, the name given to a part of the eggs or ova of animals. It varies in form and size in different eggs, some being "large-yolked," and others "small-yolked." The hen lays a large-yolked egg, the embryo being developed from a mere speck on the surface, named the cicatricula or tread. The name vitellin was formerly given to the essential substance of which the vitellus was believed to consist, but this substance has been shown to be merely a form of albumen and casein, and not a special product of organic chemistry. The vitellus consists of highly-concentrated protoplasmic or albuminous matter, along with mineral substances, and it contains the nutritive matter from which the early tissues of the embryo are formed. In many respects the egg yolk resembles milk in its nature.

VITERBO, a town of Italy, province of Rome; 42½ miles N. W. of the city of Rome. It lies to the N. of the Ciminian forest, and is surrounded by fortifications erected by the Lombards. Of its 17 churches, the chief are the cathedral of St. Lorenzo, founded in the 12th century, and the much-venerated church of St. Rosa, containing the mummy of a saint. In the former, an Englishman, Pope Hadrian IV., made the Emperor Friedrich I. hold his stirrup in token of homage. Other interesting buildings are the bishop's palace, the Palazzo Publico, with a museum, and the Palazzo Vescovile, where between 1261 and 1281 six papal elections took place. Viterbo used to be called "the city of beautiful fountains and beautiful maidens." Of the former the finest are the Fontana Grande (1206), and another in the court of the Palazzo Publico. There are some manufactures of leather, paper, playing cards, lucifer matches, soap, etc. In the neighborhood are the Bulicame sulphur springs, and 10 miles to the W. the great Etruscan cemetery city of Castel d'Asso. Pop. about 25,000.

VITET, LUDOVIC (vē-tā'), a French author; born in Paris, Oct. 18, 1802. While a journalist on "L'Univers," he wrote three dramatic poems, "The Day of the Barricades" (1826), "The States of Blois" (1827), and the "Death of "Henri III." (1829), which gave him reputation. In 1845 he became a member of the Academy. Subsequently he held official posts till the revolution of 1848. Of his later works the best known are: "Fragments and Medleys" (1846), artistic, literary and archæological criticisms; "Studies of the History of Art" (1864); "Letters on the Siege of Paris" (1870-1871). He died in Paris, June 5, 1873.

VITEX, in botany, the typical genus of *Viticeæ*, calyx short, campanulate, five-toothed; corolla irregular, five-lobed, somewhat labiate; stamens four, didynamous; fruit a globular berry, covered at its base by the calyx, and containing four one-seeded cells. *V. agnus-castus* is the chaste tree, a native of southern Europe. It has digitate leaves, with five to seven leaflets, fragrant flowers, and globular fruits with an acrid and aromatic taste. *V. trifolia*, the wild pepper, is a small tree or shrub, wild in India and Burma. The roots yield a sweet, greenish oil. It is believed that an oil can be extracted also from the seeds. The plant is anodyne, diuretic and emmenagogue. *V. negundo* is a shrub with pretty blue flowers, found in India, Ceylon and Cochin China. Its ashes are largely used as an alkali in dyeing. A pillow stuffed with the leaves is said to relieve headache, and a vapor bath prepared with them is employed in Mysore in fever, catarrh, and rheumatism. The bark and roots of *V. leucoxylon*, a large deciduous tree from India and Burma, are astringent; its fruit is eaten by the Burmese.

VITORIA, a town of Spain; capital of the province of Alava; 76 miles N. E. of Burgos. The chief buildings are four parish churches, a palace of deputies, an academy of music, theater and prison. The manufactures comprise paper, cabinet work, carriages, earthenware, etc. Here, on June 21, 1813, Wellington defeated the French under King Joseph and Marshal Jourdain. Pop. about 35,000.

VITRE, an ancient town of Brittany, in the department of Ille-et-Vilaine; on the Vilaine; 24 miles E. of Rennes. It is partly surrounded with ramparts, and contains the ruined castle of the Tremouilles. Rochers, the residence of Madame de Sévigné, is 3½ miles S. Manufactures of cloth and hats are carried on. Pop. about 10,000.

VITRIOL, a commercial name for sulphuric acid, and for several salts which that acid forms. The term vitriol was in common use among the alchemists, and was derived from vitrium, "glass," on account of the glassy appearance and transparency of copperas or green vitriol (the sulphate of iron). From copperas the alchemists prepared a strong sulphuric acid by distillation, whence also the acid was termed the oil of vitriol. In addition to these there is yet commercially known blue vitriol, which is a sulphate of copper, and white vitriol, the sulphate of zinc (zinci sulphas of the "Pharmacopœia") much used in medicine.

VITRUVIUS, POLLIO, a Roman architect of the age of Augustus; celebrated as the author of the only Latin treatise on architecture which has come down to modern times. Of the details of his life but little is known, and that little is due to incidental allusions in his own work. That he was fairly well acquainted with Greek and Latin literature; that he served as a military engineer in Africa; that he obtained the direct patronage of the reigning emperor (Augustus, according to the consent of modern scholars, but Titus, according to an older opinion advocated by Newton); and that he composed his treatise in his old age to guide the judgment of his patron in matters of architecture—are the principal facts that are thus preserved. The "Architecture" was probably completed 14 B. C. Besides the subjects strictly included under the title, it treats of water and aqueducts, sundials and machines. The style is a very bad one; at times perplexingly diffuse, and again as perplexingly curt, with an almost total absence of true literary grace; but the matter is of great value as being largely an epitome of treatises by Greek architectural writers. The authoritative MSS. are the Harleian of the 9th century and the Gordianus of the 11th. The first edition was by Sulpicius at Rome between 1484 and 1492; and the best of recent editions is by Reber (Stuttgart, 1864).

VITUS, ST., a reputed martyr under Diocletian, the son of a Sicilian pagan, but converted by his nurse Crescentia and her husband Modestus. All three perished together, in Lucania, or at Rome, the festival falling on June 15. The relics of St. Vitus are preserved at Corbey and at Prague. He is invoked against sudden death, hydrophobia, prolonged sleep, and the complaint commonly called the chorea or dance of St. Vitus; some authorities make him also the patron of comedians and dancers. It is said that in Germany in the 17th century it was a popular belief that good health for a year could be bought by bringing gifts to his image and dancing before it on his festival—a practice especially in vogue at his chapels at Ulm and Ravensburg.

VITUS' DANCE, ST. See CHOREA.

VIVIANI, RENE, a French statesman, born in Sidi-bel-Abbis, Algeria, in 1863. Having finished his education, he became an associate editor of the "Petite Republique," then was elected by the Socialists of Paris to the Chamber of Deputies. In 1893 he became Minister of Agriculture in the Clemenceau Cabinet, and when Clemenceau created the Department of Labor he made Viviani its chief. After the reorganization of the Cabinet under Briand, Viviani remained as one of the members. In 1914 he became Minister of Instruction in the Cabinet of Gaston Doumergue, which resigned in June, whereupon Viviani was called upon to form a Cabinet, of which he was Premier and Minister of Foreign Affairs. After the outbreak of hostilities he retained the position of President of the Council of Ministers, without portfolio. In the latter part of October, 1915, Viviani and his Cabinet resigned, because of opposition to the Allied policy in the Balkans, though no vote of lack of confidence was actually passed in the Chamber. Briand succeeded Viviani as Premier, but the latter remained in the new Cabinet as Minister of Foreign Affairs, holding various other portfolios in later cabinets. In 1917 he was a member of Marshal Joffre's party sent to the United States by the French Government, and in the spring of 1921 he again came on an official mission to this country.

VIVISECTION, a term denoting, in its strict signification, the dissection of living animals, but popularly employed to denote the practice of performing operations with the knife on living animals, with the view (1) of increasing physiological knowledge; (2) of converting speculative into positive conclusion; and (3) of acquiring manual dexterity in operative surgery. In this last sense vivisection is principally confined to the

French veterinary schools. By biologists the term is extended to include the performance of all scientific experiments of a kind calculated to inflict pain on living animals, and having for their object the investigation of the laws which govern life, the processes of disease, the action of heat and cold, poisons and therapeutic remedies. The practice appears to have been introduced by the Alexandrian school in the 4th century B. C.; and to this practice we owe, among many other benefits, the discovery of the circulation of the blood by Harvey; the treatment of aneurism by ligatures by Hunter; the distinction of the sensory and motor nerves by Bell; the introduction of chloroform; and the improved treatment of cerebral diseases which resulted from the researches of Brown-Sequard and Bernard. Among the chief investigators by this method of research at the present day are Burdon-Sanderson, Greenfeld, and Klein, in England; Pasteur in France, and Koch in Germany.

Vivisection has met with vigorous and organized opposition in Europe as well as in the United States, where bills have been brought before various legislatures for the restriction or abolition of the practice. On Feb. 21, 1900, a Senate Committee gave a hearing in Washington, on a bill "For the Further Prevention of Cruelty to Animals in the District of Columbia," prominent professional men and officials appearing on both sides. The proceedings were afterward published. President Eliot of Harvard is one of the leading advocates of vivisection in the United States, basing his arguments on the great advance made by its means in medical science in recent years. He objects, however, to its use in secondary schools or before college classes for the purpose of demonstration only. In England, the passage of the "Cruelty to Animals Act" of 1876 legalized vivisection with restrictions according to which it must be performed under license, the only experiments allowed without anæsthetics being such as inflict no pain greater than the prick of a needle. The "London Anti-Vivisection Society," founded in 1876, has worked actively for the abolition of the legalizing act. A similar society exists also in the United States and a number of other countries.

VIZAGAPATAM, the chief town of the district of the same name, in Madras presidency, British India; on the sea-coast; 380 miles N. E. of Madras. It stands at the head of a bay, on a small river, and carries on a large coasting trade. One of the points of the bay, called the Dolphin's Nose, rises 1,500 feet above the sea. A British factory was settled there in the middle of the 17th century. There are special manufactures of cotton cloth, gold and silver embroidery, silver, ivory and horn ornaments. The exports are chiefly piece goods, oil seeds, and sugar. Pop. about 45,000. The district of Vizagapatam occupies the strip below the Eastern Ghauts S. of Ganjam and the wild hill country behind; area, 18,344 square miles. The hills rise to the height of 5,000 feet. The crops are rice, oil seeds, sugar cane and tobacco. Sugar is extensively manufactured under European superintendence. This tract formed one of the northern Circars occupied by the British in 1767, and includes the semi-independent states of the Jeypur agency.

VIZETELLY, HENRY RICHARD, an English publisher; born in London, July 30, 1820. He was the first publisher to introduce to English readers "Uncle Tom's Cabin," and the works of Poe, Tolstoi, and Zola, being prosecuted and imprisoned for bringing out the novels of the French realist. In 1843 he founded the "Pictorial Times," one of the pioneer journals of the British pictorial press. He acted as Paris correspondent of the "Illustrated London News" (1866-1876), and represented the government at foreign expositions. His earliest work, "The Story of the Diamond Necklace" (1867), a sketch of the Countess de la Motte, was followed by a translation of Topin's "Man With the Iron Mask" (1879); "Berlin Under the New Empire" (1879); "Paris in Peril" (1882), a vivid account of the siege of 1870-1871; "A History of Champagne," a monograph on wines; "Glances Back Through Seventy Years" (1893). He died in Tilford, near Farnham, England, in 1894.

VIZEU, a town of Portugal, in a district of the same name, province of Beira; 50 miles N. N. E. of Coimbra. It is old, irregularly built on a hill, and contains a cathedral with fine paintings, also a college, hospital and theater. There are two large squares, in one of which a great market is held in September. Among many Roman and Moorish remains is a Roman camp, the Cava de Viriatho, where Junius Brutus was defeated by Viriathus. Pop. 7,000.

VIZIANAGRAM, a town in the district of Vizagapatam, Madras presidency, British India; 35 miles N. of Vizagapatam, and 12 miles from the sea-coast. In the fort is the palace of the Rajah of Vizianagram, a Rajput family which figures largely in the early history of the British in Madras. Pop. about 40,000.

VIZIER, the title of a high political officer in the Turkish empire and other Mohammedan states. The title is given in Turkey to the heads of the various ministerial departments into which the divan or ministerial council is divided, and to all pashas of three tails. The prime minister, or president of the divan, is styled the grand vizier, vizier-azam, or sadr-azam. In India vizier was the title of the highest officer at the Mogul court at Delhi; and nawab-vizier ultimately became the hereditary title in the dynasty ruling at Oude.

VLADIKAVKAZ, capital of the former Russian province of Terek, in northern Caucasia, at the foot of the main Caucasus chain, and at the opening of the valley of the Terek. It is the terminus in this direction of the Russian railway system, and is on the only carriage road through the Dariel Pass to Tiflis and the S. of the mountains. There is a fortress here, and considerable trade. The inhabitants are Cossacks, Armenians, and a motley representation of various Asiatic races. Pop. about 80,000.

VLADIMIR, a province of Russia, surrounded by Jaroslav, Kostroma, Nijni Novgorod, Riazan, Moscow, and Tver; area, 18,862 square miles. The surface consists of level and undulating plains, and the soil is fertile. About 32 per cent. is covered with pine forests. The whole province is drained by the system of the Oka, which flows for 82 miles through Vladimir, and receives from the left the Kliasma, with its navigable tributary, the Tesa. The largest lake is Plechejevo, which receives the Trubesh, and sends the Great Nerl to the Volga. The principal crops raised are buckwheat, rye, oats, potatoes, pulse, flax, cherries, and onions. In industrial activity, Vladimir ranked next to Moscow and Petrograd before the World War. Its manufactures included paper, crystal, glass, chemicals, brandy, cotton, linen, and woolen fabrics, and metal wares, chiefly knives, chisels, locks, gimlets and reaping hooks. The forests yielded timber, pitch, and tar. A special industry of Vladimir was the manufacture of icons. Pop. about 1,800,000.

VLADIMIR, the capital of the province of Vladimir, is on the Kliasma, 110 miles E. N. E. of Moscow by rail, has 28 churches, two monasteries, handsome government buildings, etc., and manufactures of icons. Pop. about 45,000.

VLADIMIR I., a Czar of Russia, commonly called VLADIMIR THE GREAT, or SAINT VLADIMIR; son of the Grand-Duke Sviatoplav by a woman of low condition, and great-grandson of Rurik. His father assigned to him the government of Novgorod, dividing the rest of the empire between his two legitimate sons, Jaropalk and Oleg. In 977 Jaropalk quarrelled with Oleg and killed him, and Vladimir would probably have met the same fate had he not fled to the Varangians. Two years later he returned with an army, overcame Jaropalk, and remained sole master of the empire, having his capital at Kiev. He then set himself both to extend and consolidate his dominions, which were little better than a collection of tributary states, scarcely subject to any real control. He enlarged his boundaries from the Black Sea to the Baltic, and appears to have had an intention of welding his empire into a homogeneous mass through the agency of a common religion, in which he tried to combine the Slavonian and the Finnish superstitions. In 988, however, an event occurred which altered his schemes entirely. He had already five wives and almost 1,000 concubines, but while besieging the Christian city of Cherson, in the Crimea, he conceived the idea of demanding the hand of Anna, the sister of the Byzantine Emperors Constantine and Basilios. Through the agency of this princess, known in history as Anna Romanovna, he was converted to Christianity. His subjects, who had already been prepared for Christianity by intercourse with the Greeks, followed his example. The Scriptures had already been translated into Slavonic by Cyrillus and Methodius, and Russia soon became a Christian country. Vladimir was then as enthusiastic in his Christian virtues as he had formerly been in his heathen vices. He died in Beresyx in 1015 at a great age, and divided his empire among his 12 sons. The Russian Church canonized him, and gave him a rank equal to that of the Apostles, and the famous "Vladimir order" was founded in his honor by the Empress Catherine II. in 1782.

VLADIMIR II., called MONOMACHUS, after his maternal grandfather, the Emperor Constantine Monomachus, was born in 1052, and succeeded to the empire in 1113, in opposition to the ordinary Slavonic rules of inheritance. Though not free from some of the barbarisms of his age, he did much for Russia by the establishment and enforcement of just laws, and the consolidation of the internal affairs of the empire. He was married to Gida, daughter of King Harold of England, and his granddaughters married the kings of Norway and Denmark, so that the famous Valdemar of Denmark, probably so named in his

honor, was his great-grandson. He died in Kiev, May 19, 1126, leaving behind him a long "testament" full of instructions to his descendants, which presents a curious picture of contemporary manners and opinions.

VLADIVOSTOK, a seaport of eastern Siberia; on the harbor of the Golden Horn in the Gulf of Peter the Great, Japan Sea. It was founded in 1861, and is an important naval station of Russia, and the E. terminus of the Trans-Siberian railway, the first sod of which was cut at Vladivostok, May 24, 1891, the line being opened in December, 1901. The harbor is surrounded by hills which are well fortified. There are two large dry docks, waterworks, electric street railways, and street lighting plants. Vladivostok is an open port. Ice-breaking steamers keep the harbor open in the winter months. Pop. about 100,000.

Vladivostok, during and following the revolution in Russia, became an important strategic center. It was the headquarters of the American Expeditionary Force to Russia, and of other foreign expeditions. See RUSSIA; SIBERIA.

V MOTH, the *Halia wavaria*, a rather common European geometer moth, family *Macaridæ*. Antennæ of the male pectinated, those of the female simple. Wings gray, tinged with a faint iridescence or purple gloss; the fore wings streaked, and having four conspicuous spots, the second shaped like a V, whence the name. The caterpillar feeds on the gooseberry.

VOCAL CHORD, in anatomy, one of the inferior thyro-arytenoid ligaments or elastic membranes, the edges of which form the side of the glottis. The vocal chords are attached in front to the thyroid cartilage, and end behind in a process of the arytenoid cartilages. They nearly close the aperture of the windpipe. In addition to them there are upper or false vocal chords, which are not immediately concerned in the production of the voice.

VOCATIONAL EDUCATION, the inclusion in the public schools of courses which have as their object the practical training of the pupils in the technical details of trades or professions, as distinguished from the purely academic courses of those schools in which Latin formed one of the chief studies. The first instance of vocational training is on record as the law passed by Massachusetts, in 1642, which authorized the towns to educate the children of shiftless parents in useful trades. Virginia passed a similar law in 1646. In 1824 the House of Refuge for delinquent boys was established in New York, which sought to make useful members of society of the children of criminal parents. Later vocational training was extensively put into practice in reformatories throughout the county. It was not till 1890, however, that the idea was introduced in schools for normal children, but between that year and 1905 vocational training courses were introduced in the public schools of over two hundred cities. It is now almost universally a part of the curriculum of all public schools, especially in the high school grades. In February, 1917, the Smith-Hughes Act was passed by Congress, which created a Federal Board of Vocational Education, which was granted a large appropriation by Congress for the purpose of instituting vocational training courses in the various States, largely for adults, in co-operation with the educational authorities of the States and municipalities. The main object was to provide for sailors and soldiers who had been injured and crippled during the war, so that they might be fitted for a return to civilian life.

VOCHYACEÆ, or **VOCHYSIACEÆ**, in botany, vochyads; an order of hypogynous exogens, alliance Sapindales; trees or shrubs with opposite branches, four-angled when young. Leaves normally opposite, the upper ones sometimes alternate, with glands or two stipules at their base; flowers generally in terminal panicles or large gaily-colored racemes; sepals four to five, unequal in size, the upper one the largest and having a spur; petals one, two, three, or five, unequal; stamens one to five generally opposite to the petals, most of them sterile, but one having a four-celled fertile anther; style one; stigma one; ovary three-celled, each with one, two, or many ovules; capsule three-angled, three-celled, three-valved, or occasionally one-celled, one-seeded; seed usually winged. Natives of tropical America.

VODKA, an intoxicating spirit distilled from rye, and formerly much used in Russia.

VOGELWEIDE, WALTHER VON DER, see WALTHER VON DER VOGELWEIDE.

VOGHERA, a town of Italy; province of Pavia; on the Staffora; 81 miles E. of Turin. It was fortified by Giovanni Galeazzo Visconti, and an old castle still exists built by him toward the end of the 14th century. The church of St. Lorenzo, founded in the 11th century, and remodeled in 1600, is the only building of importance, but the town is

handsome and well laid out. There are considerable manufactures, chiefly of cloth and hats. Pop. about 15,000.

VOGLER, GEORG JOSEPH, a German musical composer, usually styled the Abbé (Browning's Abt) Vogler; born in Würzburg, Germany, June 15, 1749, the son of a violin maker. He studied at Bamberg, Mannheim, Bologna, and Padua; was ordained priest at Rome in 1773; and made Knight of the Golden Spur, and prothontary and chamberlain to the Pope. Returning to Mannheim, he established there his first school of music; his second was that at Stockholm, where in 1786 he had been appointed kapellmeister. After years of wandering and brilliant successes as a player on his "orchestrion" at London and half over Europe, he settled as honored kapellmeister at Darmstadt, and opened his third school, the chief pupils of which were Gänsbacher, Weber, and Meyerbeer. He died in Darmstadt, Germany, May 6, 1814.

VOGÜE, CHARLES JEAN MELCHIOR, MARQUIS DE (vō-gü-ā′), a French archæologist; born in Paris, Oct. 18, 1829. His studies are mainly in the departments of the history of religion and Oriental art. He is author of: "The Churches of the Holy Land" (1859); "The Temple of Jerusalem" (1864); "Civil and Religious Architecture in Central Syria, from the First to the Sixth Century" (2 vols. 1865-1877); in "Semitic Inscriptions" (1869-1877). In 1901 he became a member of the French Academy. He died in 1914.

VOGUE, EUGÈNE MELCHIOR, VICOMTE DE, a French diplomatist; born in Nice, France, Feb. 25, 1848. He was Minister of Foreign Affairs (1871) and later in the diplomatic service, but left it in 1881 to devote his time to literature. He published: "Syria, Palestine, Mount Athos" (1876); "Oriental Histories" (1879); "The Son of Peter the Great" (1884); "The Russian Romance" (1886); "Souvenirs and Visions" (1887); "Remarks on the Centennial Exposition" (1889). He was a member of the French Academy. He died in 1910.

VOICE, an audible sound produced by the larynx, and effected by its passage outward through the mouth and other cavities. When so modified in particular ways it becomes speech or song. The main difference between these two latter are that speech is more limited in compass or pitch, that it is less sustained in respect of pitch, and is not confined to the notes of a musical scale, that it is associated with a less clear or open passage for the breath, and that it presents certain utterances (consonantal, aspirate, guttural, etc.) which have not a purely musical character. The larynx is the organ by which the so-called vocal sounds (or primary elements of speech) are produced; and it was in former times keenly debated to which class of musical instruments the larynx might best be compared. Dr. Witkowski says ("Mechanism of Voice, Speech, and Taste"): "Galien compares it to a flute, Majendie to a hautboy, Despiny to a trombone, Diday to a hunting horn, Savart to a bird catcher's call, Biot to an organ pipe, Malgaigne to the little instrument used by the exhibitors of Punch, and Ferrein to a spinet or harpsichord. The last named compared the lips of the glottis to the strings of a violin; hence was given the name vocal chords, which they still retain. The current of air was the bow, the exertion of the chest and lungs the hands which carried the bow, the thyroid cartilages the *points d'appui*, the arytenoids the pegs, and, lastly, the muscles inserted in them the power which tensed or relaxed the chords."

In different larynxes much depends on the relative sizes of the vocal chords; thus a man with a bass voice has longer vocal chords than a child or woman; but as between basses and tenors, tenors and contraltos, or contraltos and sopranos, the higher voice may sometimes appear to have the longer vocal chord; on the other hand, slenderness of structure makes up for greater length, and when the vocal chords are long and slender, the voice is "flexible," for the chords readily enter into vibration. Further, a narrow larynx is conducive to high pitch, and so is not only the size but also the form of the female larynx, in which the upper part, above the false vocal chords, and between them and the hyoid bone, is comparatively flat. In children the larynx is small, and the voice high-pitched; but the larynx grows very rapidly at puberty; and as its different parts do not then grow with proportionate rapidity, the muscular control is uncertain, and the voice, especially in boys, breaks.

Modifications in the form of the resonating cavities result, by resonance, in those modifications of timbre which we call vowels. In pronouncing *u* (=*oo* or Italian *u*) we round the lips and draw down the tongue, so that the cavity of the mouth assumes the form of a bottle without a neck; if the lips be opened somewhat wider and the tongue be somewhat raised, we hear *o;* if the lips be wide open and the tongue in its

natural flat position, we hear *a;* if the lips be fairly open and the back of the tongue raised at the same time, the vowel produced is *e;* and if we raise the tongue still higher, and narrow the lips, we hear *i.* Each of these resonance chamber forms has its own dimensions and its own resonance pitch; and of these *u* has the lowest pitch, as may be heard by whispering the vowels, or by means of a series of tuning forks successively re-enforced by the cavity of the mouth as a resonator; for which reason it is easier to sing *u* and *o* on low than on high notes. Diphthongs are produced by continuing the laryngeal sound during the transition from one vowel-mouth-form to another. Consonants are produced by various interruptions, total or partial, of the outflowing stream of air. If the air be completely stopped by the lips and soft palate, we have *p* when the obstruction is suddenly removed; the same action, accompanied by a certain continued sound in the larynx, and a heavier air pressure within the mouth, gives *b;* if the air be checked by the lips but not by the soft palate, so that it passes through the nose alone, we have *m;* if it be checked by the soft palate and by bringing the point of the tongue to the front of the palate, or to the gums, we have *t;* the same with continued laryngeal sound and greater air pressure gives *d;* the action for *d,* modified by allowing a little air to escape over the soft palate through the nose, gives *n;* if the air be checked by the soft palate and by bringing the middle or back of the tongue to the arch of the palate, we have (silent) *k* and (if there be laryngeal sound) *g;* the latter, but with the nasal passage open, gives *ng.*

VOIGT, JOHANNES, a German historian, born in Bettenhausen, in Saxe-Meiningen, Germany, Aug. 27, 1786. He is author of "Hildebrand as Pope Gregory VII. and His Times" (1815), in which he regards the reign of Gregory VII. as one of the most noteworthy phenomena of the Middle Ages, and Gregory himself as a great reformer; "History of the Lombard League and its Struggle with the Emperor Frederick I." (1818); "History of Prussia from the Earliest Times to the Downfall of the Domination of the Teutonic Order" (9 vols. 1827-1839); "The Westphalian Vehmgerichte or (Mediæval Tribunals) as Related to Prussia" (1836); "Margrave Albrecht Alcibiades of Brandenburg-Kulmbach" (1852); "History of the Teutonic Order in Its Twelve Circles in Germany" (2 vols. 1857-1859). He died in Königsberg, Germany, in 1863.

VOIR DIRE, in law, a preliminary examination of a witness to ascertain whether he is competent. When a witness is supposed to have an interest in the cause, the party against whom he is called has the choice to prove such interest by calling another witness to that fact, or he may require the witness produced to be sworn on his *voir dire,* as to whether he has an interest in the case or not; but the party against whom he is called will not be allowed to have recourse to both methods to prove the witness' interest. If the witness answers he has no interest, he is competent, his oath being conclusive; if he swears he has an interest, he will be rejected.

VOIT, KARL VON (foit), a German physiologist; born in Amberg, Bavaria, Oct. 31, 1831. He was appointed Professor of Physiology in the University of Munich in 1863. His first memorable scientific researches (1854) demonstrated the presence of urea in the muscular tissues of cholera patients; afterward he studied almost exclusively the questions of digestion and assimilation. His principal works are: "Physiologico-Chemical Researches" (Part i. 1857); "Effects of Common Salt, Coffee, and Muscular Action, on Digestion" (1860); "Laws of Nutrition in Carnivora" (1860), etc. He died Jan. 31, 1908.

VOKES, ROSINA, an English actress; born in London in 1858. Her first appearance was in pantomime, when a mere child, with her brother FREDERICK and her sisters VICTORIA and JESSIE. They made an instant success in London as "the Vokes family." They afterward came to the United States, where they became great favorites with the public. Rosina for a time refrained from the stage. In 1886 she organized a company for farces and comedies which annually toured in England and the United States till her death in 1914.

VOLANT, in heraldry, a term meaning flying.

VOLAPÜK, an artificial language invented in 1879 by Johann Martin Schleyer, a German priest. Schleyer's years of linguistic study as a preparation for his task, were spent in examining the structure—the mechanism of the important languages of the world. When he had closed his researches in this field, he chose the Aryan family as the general model for his invention. His aim was to produce a language free from all the defects of one of natural growth, with all irregularities and speech peculiarities eliminated. He called his invention Volapük—"World's Speech." The Roman alphabet was

used with the exception of *w* and *q*. To this the letters ä, ö, and ü were added, making an alphabet of 27 letters. The vowels are sounded as the long vowels in Italian and have but one sound. The consonants are sounded, in the main, as in English. In the compromise made necessary by the purpose of Volapük each language had to surrender something. French gave up its nasals; German, its gutturals; Italian, its liquids, while all alike gave up their articles and analytic form. Volapük is a synthetic and inflectional language like Latin. By this means it can express thought with great clearness and conciseness. The order of the words in a sentence, however, is of the modern type.

The radicals or root words, form the basis of the language. These are usually nouns. About 40 per cent. of these have been taken from English; the rest are from other Aryan languages, chiefly German, Latin, and French. By what methods the radicals, or root words, were made ready for use and from what source they were taken will now be shown. The general principle determining the choice of a root seems to have been brevity, clearness, and ease of utterance. For these reasons the Volapük word for man is *man*, a Germanic form, while the word for house is *dom*, a Latin form. The word for time is *tim*, from the Rumanian (timp); for bridegroom, *gam* from the Greek. These radicals are generally of one syllable and begin and end in a consonant, that the case endings of the nouns and arguments and personal endings of the verbs may be applied directly to the root.

They are, in the main, formed from ordinary words by three methods: (1) A consonant is substituted for a final vowel or for a difficult consonant. Thus English *pay* becomes in Volapük *pel;* French *mer* becomes *mel.* (2) Consonants and vowels are dropped out altogether. Thus German *ganz* becomes *gan*, Latin *pons* becomes *pon*, English state becomes *tat*, forest becomes *fat.* (3) The most important syllable is chosen to represent the idea conveyed by the whole word. Thus Latin *sapientia* becomes *sap;* French *tapis* becomes *tap.*

Below is a short table of Volapük roots from English, German, Latin, and French:

English	German.	Latin.	French.
giv — gift	bin — being	duk — guide.	mat — marriage.
kom — arrival.	fel — field.	fin — end.	mel — sea.
läd — lady.	fad — wire.	fug — fight.	pom — fruit
pen — pen.	gan — goose.	flum — river.	tap — carpet.
sag — (the) saying.	ket — chain.	reg — king.	tuv — discovery.
spod — correspondence	stil — silence.	sum — taking.	
ston — stone.	nad — needle.	ten — stretching.	
vom — woman			
vol — world.			

Its use, never general, has now almost entirely ceased.

VOLATILE OILS, essential oils; oils which can be distilled without decomposition. They are classed under two heads; mineral and vegetable; the former being composed of carbon and hydrogen, and generically known as paraffins. The vegetable oils, which are generally procured by distilling the odoriferous substance with water, may be divided into three great classes: (1) Oils composed of carbon and hydrogen (binary volatile oils), of which oil of turpentine may be considered the type; (2) oils containing carbon, hydrogen, and oxygen (oxygenated oils), which include most of those used in medicine and perfumery; and (3) oils containing sulphur (sulpheretted oils), characterized by their extreme pungency and suffocating odor, such as oil of mustard, asafœtida, etc. The volatile oils are generally more limpid and less unctuous than the fixed oils, and are almost colorless after rectification. They are soluble in alcohol and ether, slightly soluble in water, and mix in all proportions with the fixed oils.

VOLCANOES, orifices in the earth's strata from which molten rock, hot vapors, and fragmental material are ejected, and around which the solidified productions of eruptions accumulate. We know by observation only the surface phenomena of volcanoes. What takes place in the profounder depths, where volcanic forces are generated, or what is the nature of the subterranean process, is only conjecture. We may affirm that a volcanic eruption usually consists in the escape from the depths of the earth to the surface, of molten rock, charged with intensely hot vapors, of which the most abundant is steam. The most characteristic and impressive features of the action are those produced by the vapors suddenly relieved from the pressure to which they were subject within the earth, and blowing off into the atmosphere with extreme energy. Molten lava, prior to the eruption, is charged with these vapors in much the same way as soda water or wind is charged with carbonic acid; and when the pressure is relieved the gas is given off copiously. That molten rock may, under pressure, be made to absorb and "occlude" great quantities of water vapor has been ex-

perimentally proved. That hot lava, even after eruption and before solidification, still holds occluded water is also known. That enormous quantities of steam rush forth from the erupting and escape from the surface of flowing lava streams is the most conspicuous fact attending every eruption. The energetic action is plainly that of an elastic, high expansible agent, like steam, escaping at a very high temperature and pressure, and in enormous quantity, and cannot be due to the molten rock, which has no such elasticity, and, which, without any volatile ingredient, would be merely an inert, passive, liquid mass, incapable of producing any such dynamic effects.

The vigor of the action differs widely in different volcanoes. In some the elastic or explosive action is very mild, as in the Hawaiian volcanoes. Here the eruptions are usually unattended with the extreme violence which makes them so formidable elsewhere; the destruction is limited to that caused by the quietly flowing lava streams, which are generally of great magnitude and run for many months. In most volcanoes the action is far more energetic, and in many of them it is of the most terrible character. Those of the East Indies and some in Central America belong to the violent class, and the catastrophes produced by their outbreaks have been the most destructive which have afflicted the world. The memorable outbreaks of Papandayang, in Java, in 1772; of Tomboro, on the island of Gumbawa, in 1815; of Casaguina, in Nicaragua, in 1835; and of Krakatoa, in the Straits of Sunda, in 1883, may be regarded as literal explosions on a stupendous scale, in each of which a great mountain was blown up, and its fragments showered down over vast regions, burying or destroying everything within reach of their trajectories. The lava, instead of being poured out in a liquid stream, was blown into dust by the sudden release of its imprisoned vapors. This dust filled the air for hundreds of miles around, and was wafted by the winds to vast distances. These, however, are extreme cases. The violence of the eruption may be inferred to depend on the quantity of eruptive matter to be extravasated, the proportion of volatile ingredients contained by it, and the rapidity with which it is released from the pressure to which it is subject in the depths. Volcanoes whose vents are always open seldom cause serious trouble; and where the eruptions are frequent they are seldom of an extreme character. But when the intervals between the outbreaks are long they are apt to increase in severity. The piles of extravasated matter built up around the eruptive orifice assume numerous forms, depending on the varying conditions of the eruptions. The simplest form is a nearly symmetric cone with a crater in the truncated summit. As the forces of the eruption exhaust themselves the escaping blast of steam carries up with it clots and pellets of viscous lava, termed scoriæ and lapilli, which are blown high in the air and then descend, gradually building up a cone as they fall. This eruption may be followed by others, which deform the original cone by adding a mass of lava and secondary cone. As successive eruptions follow each other they build up a large composite pile of mingled lava, scoriæ, and lapilli. When the eruptive action is well centralized in a single large vent, giving many eruptions in the course of ages, a great mountain is slowly built, having a dominant central orifice with a crater in the summit, and a form which is rudely conical; but in detail the structure is highly complex. When the mountain becomes very large the eruptions tend to break out on its slopes, or even at its base, forming what are termed parasitic cones. Most of the great volcanic piles have large numbers of these parasitic cones, each being a secondary vent.

Volcanoes, active or extinct, are found in those portions of the earth which have been subject to extensive disturbances of the strata. It has been customary to speak of their distribution as occurring in chains. This is but a partial truth, and, as usually stated, involves a rather strained use of the idea of linear arrangements; and it is believed that the notion is in some important respects a misleading one. The general law seems to be that volcanoes occur in regions which have been subject to that mysterious subterranean action which elevates the land, builds mountains and plateaus, and deforms the strata; and there is reason to infer that they constitute one of several classes of phenomena which ultimately originate in the same category of causation. It was suggested by Charles Darwin that volcanoes occur in regions which are undergoing elevation. So far as it has been possible to put this suggestion to test it seems to have been sustained by observation. The determining cause of volcanic action has been subject to much speculation, but no satisfactory theory of it has yet been proposed. The view which has received the most consideration is that surface waters penetrate the earth to depths where the temperature is sufficient to melt the rocks, thus

furnishing the elastic agent under conditions of temperature and pressure which are adequate to the result.

The principal theaters of modern volcanic action are the Chilean Andes, the Andes of Ecuador and Peru, Central America, the Dutch East Indies, and the Philippines, Iceland, and the Mediterranean. To these must be added the remarkable Hawaiian volcanoes, and perhaps also those of New Zealand. We have reason also to infer that many extensive outbreaks occur beneath the ocean, but we know very little about them. The number of active volcanoes is usually reckoned as about 350; but it is difficult in many of these cases to decide whether the volcano is active or extinct. But the number now active is small indeed in comparison with those which have become extinct in comparatively recent geological times. Many regions abound in volcanic piles which in the course of human history have given no sign of activity. This is especially the case in the W. part of the United States, and most especially in the N. W. States and Territories. Here may be found great regions, tens of thousands of square miles in extent which have been overflowed with lava, and the successive sheets are thousands of feet in thickness. In many portions of the West the indications point to a very recent epoch for the eruptions, and it is by no means improbable that some of them have occurred since the Spanish conquest. In all ages of the geological history of the planet, and as far back as we are able to discriminate the relative antiquity of the strata, volcanic eruptions have been abundant and of the same general character as those which now prevail. Nor is it possible to say whether they were generally more extensive or less so than at present. Two of the most remarkable of active volcanoes are Mauna Loa and Kilauea, in Hawaii; the former 13,760 feet in height and the latter, though only about 4,000 feet high, 8 miles in circumference. On the summit of Mauna Loa is a circular crater 8,000 feet in diameter, its walls nearly vertical and many hundreds of feet deep. The eruptions of this volcano have been of great volume and at an average interval of eight years; each outflow representing more lava than Vesuvius has sent out since the destruction of Pompeii. The Hot Lakes district of North Island, New Zealand, was the scene of remarkable volcanic disturbances in 1886. The effect extended over 60 square miles, burying whole villages and causing much loss of life. The eruption was accompanied by violent earthquakes and hundreds of new geysers broke out. The fine volcanic dust that settled over the province of Auckland proved to be beneficial to vegetation. The most destructive of modern volcanic eruptions was that of Mont Pelée in the island of Martinique in May, 1902.

VOLE, the *Arvicola*, a genus of rodents typical of the sub-family *Arvicolinæ*, which also includes the lemmings (*Mylodes*), the musk rats (*Fiber*), and several related genera. The genus *Arvicola* includes over 40 species distributed over Europe, Asia, and North America—all more or less like rats and mice. In Great Britain there are three—the water vole (*A. amphibius*), the field vole (*A. agrestis*), and the bank vole (*A. glareolus*). The water vole is about the same size as the brown rat, and rat it is often called. It has dark brown or black fur, a tail about half the length of the body, and very strong hind feet, with five rounded pads on their lower surfaces. It burrows by the banks of streams and feeds for the most part on vegetable food. In summer the female has three or four litters of two to seven young. The water vole does not occur in Ireland. The field vole or short-tailed "field mouse," is about the size of a common mouse, but the body is plumper and the tail shorter. It has brownish-gray fur; its hind feet have six pads. It lives in fields and woods, feeds on vegetable food, is very prolific, and often does much damage. The bank vole is like the field vole, but has a "more or less rusty or rufous-colored back, larger ears, and a longer tail." Its habits are like those of the field vole.

VOLGA, the largest river of Europe; rises in the central Russian province of Tver, near the Dwina, about 200 miles from the Gulf of Finland; flows S. E. through several small lakes, receiving the Selicharovka from Lake Seliger, then S. E. past Rsjev to Subzov, where it turns N. E., passing Tver and Rybinsk, then S. E. through the provinces of Jaroslav, Kostroma, Nijni Novgorod, and Kasan, passing Nijni Novgorod and Kasan, and receiving from the right the Oka, and from the left the Mologa, Kostroma, Unsha, and Wetluga. At Kasan it turns S., receives from the left the great Kama and the Samara, and from inces of Simbirsk, Saratov, Samara, and the right the Sura, separates the provpasses the towns of Simbirsk, Samara, Sysran, Wolsk, and Saratov. At Sarepta it turns sharply to the S. E. and flows in that direction to the Caspian, which it enters by 8 principal and 200 smaller

mouths, forming a delta 68 miles in breadth. Besides those named, about 100 smaller tributaries join this giant river, which with its affluents has a drainage area of 563,300 square miles, waters 22 provinces, and measures from its source to its mouth 2,300 miles. Its breadth at Tver is 705 feet, at the mouth of the Mologa 1,542 feet, above the influx of Kama 4,920 feet and opposite the mouth of the Kama nearly 5 miles. The course of the Volga is very slow, its total fall is only 896 feet, and its channel is comparatively shallow, its greatest depth being 85 feet. The Volga is free from ice for 200 days in the year, in Kostroma, Jaroslav, and Kasan for 152. Steamers ply regularly on its waters between Tver and Nijni Novgorod, Kasan, and Astrakhan; and from Nijni Novgorod by the Kama to Perm, by the Oka to Riazan, by the Ufa to Ufa, and by the Unsha to Ugor. The three great canal systems of Vishni-Volotchok, Tichvin, and the Marien canal, connecting the Volga with Petrograd, and the canal of the Duke of Württemberg joining it with the Dwina, make an unbroken water way between the Baltic and the Caspian Sea. A canal to join the Volga with the Don, between Zarizyn at Katchalinsk, was projected by Peter the Great, but was never executed. Its purpose is now effected by the Zarizyn-Kalatsch railway. The Volga has extensive fisheries, chiefly of salmon and sturgeon.

VOLHYNIA, a province in Poland, bounded on the W. by the Polish provinces, from which it is separated by the Bug river. The surface in the N. of the province is low, and plains and morasses, covered with forests, abound; in the S. there are hills and fertile, corn-bearing land. Among the rarer mineral products are lithographing stone and porcelain clay. Volhynia was the scene of almost constant military operations during the World War. The area (27,743 square miles) is larger than that of Greece; pop. about 3,600,000. The capital is Zhitomir; pop. about 80,000.

VOLKMANN, ALFRED WILHELM (folk'män), a German physiologist; born in Leipsic, Germany, June 1, 1801. He was Professor of Physiology in Halle and made special studies of the nervous system and the sense of sight. Among his works are: "Anatomy of Animals, Illustrated with Plates" (1831-1833); "Contributions to the Physiology of the Sense of Sight" (1836); "The Independence of the Sympathetic System of the Nerves" (1842); "Dynamics of the Blood" (1850); "Physiological Researches in the Department of Optics" (1863-1864); "Elasticity of Muscles" (1856). He died in Halle, Germany, April 21, 1877.

VOLKMANN, RICHARRD VON (RICHARD LEANDER), a German surgeon; born in Leipsic, Germany, Aug. 17, 1830. He was Professor of Surgery in the University of Jena. Among his professional writings are: "Diseases of the Motor Organs" (1865); "Manual of Surgery" (1865); "Contributions to Surgery" (1875). He wrote also: "Reveries at French Firesides," a series of tales (1871; 22d ed. 1894); "From Student Times" (1876); "Poems" (3d ed. 1885); "Short Poems" (2d ed. 1889); "Old and New Troubadour Songs" (2d ed. 1890). He died in Jena, Germany, Nov. 28, 1889.

VOLKMAR, GUSTAV (folk'mär), a German theological writer; born in Hersfeld, Hesse, Germany, Jan. 11, 1809. He was Professor of Theology in the University of Zürich. His principal works are: an edition of "The Gospel of Marcion" (1852); "Justin Martyr and his Relation to our Gospels" (1853); "Sources of the History of Heresies down to the Nicene Council," vol. i., "Hippolytus and the Philosophumena" (1853); "Religion of Jesus and Its First Development" (1857); "Origin of our Gospels" (1866); "Life and Works of Zwingli" (1870); "Myths of the Popes" (1873); "The Synoptics and the Historical Facts of the Life of Jesus" (1877); "Jesus of Nazareth and the Early Christian Times" (1882); "Paul from Damascus to the Epistle to the Galatians" (1887). He died in Zurich, Switzerland, Jan. 10, 1893.

VOLNEY, CONSTANTIN DE, COUNT (vol-ná); family name CHASSEBŒUF (shasbuhf), a French philosopher and traveler; born in Craon, France, Feb. 3, 1757. He published in 1787 his "Travels in Egypt and Syria" (2 vols.), the best description of them to that date. In 1789 he was elected a deputy to the States-General. In 1791 he produced a work on which his fame principally rests—"Ruins; or, Meditations on the Revolutions of Empires." Imprisoned in 1792, on his release he passed two years in the United States, publishing in 1803 his "Description of the Climate and Soil" of the country. Among his other works are: "The Natural Law; or, Physical Principles of Morality" (1793), and "Researches in Ancient History" (3 vols. 1814). He died in Paris, April 25, 1820.

VOLOGDA, a province of Russia, S. of Archangel and N. of Kostroma; area,

155,498 square miles. Its surface is mostly a vast plain, becoming hilly toward the S., and mountainous toward the E., where the Urals expand into a wild highland tract. Only in the S. of the province is agriculture possible. Most of the province lies in the great forest zone, and 87 per cent. of its surface is covered with pine woods. Vologda is drained chiefly by the Dwina and its tributaries toward the White Sea; the Petchora flows through the N. E. part to the Arctic Ocean. Hunting and fishing are almost the only employments in the major portion of this province. Salt, skins, and iron are exported. Pop. about 1,500,000.

VOLOGDA, the capital of the province of Vologda, on the Vologda, a tributary of the Suchona; 281¼ miles N. of Moscow, is an old wide town, largely built of wood, the residence of the governor and a bishop. It has over 50 churches, a theological seminary, a gymnasium, and several monasteries. Before the World War there were extensive manufactures of sailcloth, leather, soap, matches, linen cloth, glass, white lead and jewelry. Vologda was founded in the 12th century. During the 16th it was a great center of trade with England, and many English settled here. Pop. about 30,000.

VOLSCI, a people of ancient Latium, whose language proves them to have been a branch of the Umbro-Sabellian stem, and who, holding the Pontine Marches, the valley of the Liris, and the Volscian Hills, extended from the sea-coast to the Samnite frontier. With Rome they seem from an early period to have waged constant wars, with one of which the legend of Coriolanus is associated, but Rome had entirely subdued them by 338 B. C., from which date they vanish as a separate race from history.

VOLSK, or **VOLJSK**, a town of Russia, province of Saratov; on the Volga; 80 miles N. E. of Saratov. It has several churches, a technical school, normal school, etc. There are large quays along the river, and trade in tallow and skins with Petrograd, in fruit with Nijni Novgorod, and in corn with Astrakhan and Rybinsk was carried on before the World War. A great market is held in autumn. Pop. about 40,000.

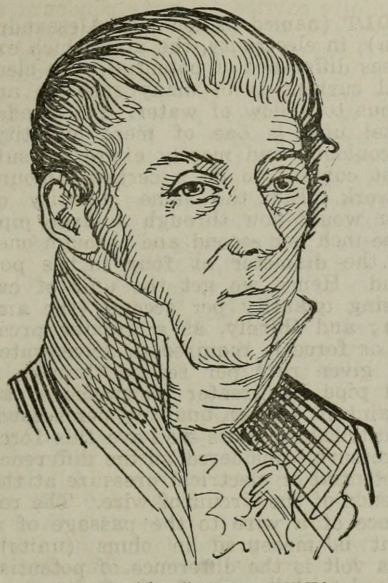
VOLSUNGS, a famous heroic race in old German legend, its founder Volsung or Walsung, the grandson of Odin, and its brightest ornament Volsung's son. Siegmund. Sigfried or Sigurd, hero of the "Nibelungenlied," is of the same stock. The tale is enshrined in the Old Icelandic Volsungasaga, which has been followed by William Morris in his "Story of Sigurd the Volsung."

VOLT (named in honor of Alessandro Volta), in electricity, the unit which expresses difference of potential. An electrical current is in many respects analogous to a flow of water. The fundamental unit is one of mere quantity, the coulomb, and merely expresses sufficient current to do a certain amount of work. But the same quantity of water would flow through a large pipe at one inch per second, and through one-half the diameter at four inches per second. Hence we get the unit of expressing quantity per second (the ampère); and thirdly, as a greater pressure or force is required to drive water at a given rate per second through a small pipe, or greater resistance so as to maintain a given quantity per second, in electrical currents we have this force or pressure, considered as the difference of potential or electrical pressure at the two ends of the circuit of wire. The resistance of a wire to the passage of a circuit is measured in ohms (units), and a volt is the difference of potential required to drive an effective current of one ampère through a wire interposing the resistance of one ohm.

VOLTA, a river of west Africa; which, rising in the Kong Mountains or highlands behind the Ashanti country, runs S. between Ashanti and Dahomey, and reaches the Bight of Benin through the E. part of the British Gold Coast. To left and right of its mouth it forms great lagoons, and on the bar across the mouth a heavy surf runs.

VOLTA, COUNT ALESSANDRO, an Italian natural philosopher; born in Como, Italy, Feb. 18, 1745. Two treatises, published in 1769 and 1771, in which he gave a description of a new electrical machine, laid the foundation of his fame. He was successively Professor of Physics at the gymnasium in Como and in the University of Pavia. He invented the electrophorus, electroscope, electrical condenser, electrical pistol, and the voltaic battery in the form known as "crown of cups." He also devised several other electrical appliances, and in 1800 the voltaic pile. To him is due the theory that electricity is generated by the contact of dissimilar metals, a correction of Galvani's animal electricity theory. In 1782 he made a tour through France, Germany, England, and Holland. In 1801 Napoleon invited him to France, where a medal was struck in his honor. In 1810 he was created a senator of Italy, with the title of count; and in

1815 was made director of the philosophical faculty of Padua. Volta's name is



COUNT ALESSANDRO VOLTA

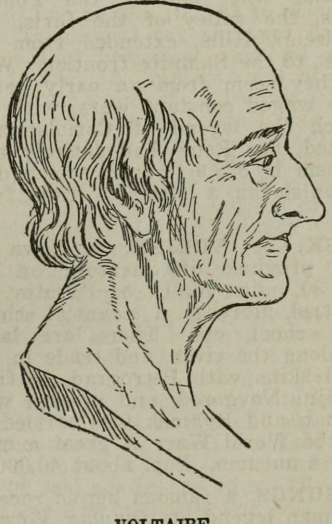
perpetuated in a large number of electrical terms. He died in Como, March 5, 1827.

VOLTAIC BATTERY, a term sometimes applied to a Voltaic pile, but more specifically used for a battery of several voltaic cells; known also as a galvanic battery (from Galvani), though the honor properly belongs to Volta. See ELECTRICITY; VOLTA.

VOLTAIC PILE, Volta's arrangement for producing a current of electricity, consisting of a pile of alternate disks of two dissimilar metals, as copper and zinc, zinc and silver, zinc and platinum, separated by pieces of flannel or pasteboard moistened with salt water or with water acidulated with sulphuric acid.

VOLTAIRE, the assumed name of FRANÇOIS MARIE AROUET, a French poet, historian and philosopher; born in Châtenay, near Paris, in 1694. He was educated by the Jesuits at the College of Louis le Grand, and already showed so clearly the characteristics which marked him through life, that one of his teachers foretold his eminence as the "Coryphée du Déisme." He was early introduced at the *Salon* of Ninon de l'Enclos, and became familiar with some of the most distinguished persons of the time. Ninon, pleased with his remarkable intelligence and liveliness, left him a legacy of 2,000 francs, to buy books. His father's ambition was that he should become, not author, but lawyer and judge; and to break off his associations in Paris, sent him away in 1713, as page to the Marquis de Châteauneuf, ambassador to Holland. He was soon sent home, however, after getting into trouble about a love affair, and was next placed with a lawyer. Quickly and finally escaping this attempt to tame and train him for official life, he soon appeared in Paris again, and from that time he pursued his course as a literary man.

In 1716 he was committed to the Bastille, on suspicion of being the author of a satirical poem on Louis XIV., and remained there a year. His first literary work of mark was the tragedy of "Œdipe," which, with much difficulty, he got represented in 1718. During a visit to Brussels in 1721, he was introduced to Rosseau, but this interview made enemies of them forever. He was sent to the Bastille a second time, in consequence of a quarrel at the Duke de Sully's house, and after his release, spent three years in England, where the prevalence of free-thinking made an atmosphere congenial to him. Here, in 1728, he published his celebrated epic poem, "La Henriade," under the title of "La Ligue," and applied himself to other literary labors. He rose speedily to the summit of renown as an epic poet; was courted in all the higher circles; and when he returned to France, he found



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himself a sort of national idol among the French. After the publication of several plans, he retired, about 1735, to Château de Cirey, near Vassy, in Champagne, be-

longing to the Marchioness du Châtelet, a lady celebrated for her love of mathematics and abstruse sciences, and who read Leibnitz and Newton in the original Latin. During the several years of his residence with Mme. du Châtelet, a connection which Lord Brougham defends as entirely Platonic, he wrote, between other works, his "Elements of the Philosophy of Newton," in which he explained the theories of the great discoverer, with clearness, elegance, and learning, though perhaps not always with accuracy. A new epoch opened in his life, when, in 1736, he was flattered by a letter from Frederick, Prince-royal of Prussia, afterward Frederick the Great. These two remarkable men first met after the accession of Frederick to the throne in 1740. The meeting was at a château near Cleves, and a second took place soon after at Berlin. The first Silesian war separated them, and Voltaire returned to Holland. They continued, however, to correspond. For a while, in 1746, Voltaire removed to Paris, where he received the appointment of historiographer of France and gentleman of the king's bed chamber. He was at the same time received at the Academy. Soon losing favor at the court, he accepted, in 1750, the often renewed invitation of Frederick II. to settle at his court. Frederick received him with transports of joy. He was lodged in the apartments of the Marshal de Saxe; the king's cooks, servants, and horses were placed at his disposal; he was granted a pension of $4,000; and he and the king studied together for two hours a day, while he was welcomed to the king's table in the evening. At first the connection seemed a charming one, but Voltaire soon learned by demonstration, not only that courts are wearisome places, but that Frederick of Prussia and François Arouet were too much like each other to become real friends. Their intimacy, chiefly fruitful in jealousies, dissensions, and all kinds of uneasiness, ended after three years by the flight of Voltaire. At Frankfort he was joined by his niece, Mme. Denis; and at the same city he was arrested by the Prussian resident, and detained till a volume of Frederick's poems was given up. After a short stay at Colmar, and some trouble about his "Essay on Morals" he settled with Madame Denis at Ferney, then a mere hamlet, near the Genevese territory. There he passed the last 20 years of his life, unwearied in writing, and at the same time active in promoting the interests of the little village, which, under his fostering care, grew up into a neat little town, and became the seat of a flourishing colony of watchmakers.

As the home of Voltaire, Ferney became a center of attraction for the most distinguished persons of all countries. Voltaire carried on correspondence with Frederick the Great and Catherine II. of Russia; pleaded eloquently and successfully for the Calas family; educated the grand-niece of Corneille, and gave her a marriage portion; and offered Rousseau an asylum. His books and his speculation in the funds had made him enormously rich, but he spent nobly his fortune, and the fugitives from the civil troubles of Geneva and other towns always found an asylum beneath his roof. At the age of 84, yielding to the importunity of his niece, he once more visited Paris, where he brought out a new tragedy, "Irene." His whole journey and his reception there was one continuous splendid triumph. He was everywhere attended by crowds; occupied the director's seat at the Academy, was crowned at the theater; and then exhausted by the excitement and loss of sleep, took opiates, and, after great suffering, fell into a lethargy, and so died, May 30, 1778. Among his latest words were these: "I die worshiping God, loving my friends, not hating my enemies, but detesting superstition." The curé of St. Sulpice refused the rites of burial, and the body of the "great mocker" was interred by night in the abbey of Sullières, whence it was removed at the Revolution and deposited in the Pantheon. The works of Voltaire in the most complete editions, fill 70 volumes, 8vo. In addition to those already named, are the plays, "Zaïre," "Mahomet," "Merope," and "Oreste"; the too celebrated poem "La Pucelle"; the "Story of Charles XII."; the "Century of Louis XIV."; the "Essay upon the Morals and Wit of Nations"; the satirical novel, "Candide, the Optimist"; and the "Dictionary of Philosophy."

VOLTAMETER, in electricity, an instrument for measuring the work, and thus indirectly the strength of a voltaic current. This is done by the amount of electro-chemical decomposition, a certain current reducing a certain amount of hydrogen from water, silver or copper from their salts, etc. This must not be confounded with voltmeter.

VOLTERRA, a town of Italy, province of Pisa; 5 miles from Saline, which is 48½ miles S. E. of Leghorn. It is surrounded by ancient walls with great gates, the chief of which is the Porta all'-Arca. The cathedral, opened in 1120, contains fine marble sculptures; the baptistry of St. Giovanni and the church of St. Francesco have valuable frescoes and other paintings. The citadel, founded in 1343, with a more modern

addition called Il Masteo, was long used as a penitentiary. In the Palazzo Communale is the Museo Civico, founded in 1208, and containing a valuable collection of Etruscan antiquities and a library. Volterra has also remains of baths and an amphitheater. Large alabaster works are the main industry of the town. At Saline are important salt works and borax springs. Near Volterra are also several Etruscan burying places and a subterranean labyrinth. The ancient Volaterræ (Etruscan Velathræ), Volterra, was one of the 12 great Etruscan cities. The Romans took it in 474 B. C., and it became an important municipium, resisting a siege by Sulla for two years. Pop. (commune) about 17,500.

VOLTMETER, in electricity, any instrument for measuring the pressure, electromotive force, or difference of potentials at the ends of an electric current. The gold-leaf electroscope is a kind of voltmeter, but will only measure large differences of potential. If the terminals are connected with flat plates arranged parallel to each other, one of which is movable, the attractive force between the plates at a given small distance will be a voltmeter. This method is too coarse for ordinary currents, but a modification of it is employed in Thompson's quadrant electrometer. In Cardew's voltmeter the heating effect of the current in a wire, which varies with the electromotive force, and is measured by the expansion produced, is employed. In the majority of instruments the electro-magnetic action is employed in some form of galvanometer. These are more usually wound to act as ammeters, and if wound with very thin wire the high resistance allows the electromotive force required to drive a certain current through them to be calibrated and denoted in volts. Such instruments are adjusted or calibrated by comparison with a "standard" voltaic cell or voltameter.

VOLTURNO, a river of Italy, rising in the province of Campobasso; flows S. E. to its junction with the Calore, and then W. past Capua into the Mediterranean, 20 miles S. E. of Gaeta; course, about 100 miles.

VOLUME, the space occupied by a body; dimensions in length, breadth, and depth; compass, mass, bulk. In chemistry, the volume of an irregular body may be found from its weight and specific gravity; that is to say, the weight of a unit volume. If w be the weight of the body in grammes, and s its specific gravity, the fraction $\frac{w}{s}$ gives its volume in cubic centimeters. The capacities of vessels are determined by filling them with water or mercury from a measuring tube, or other vessel whose capacity is previously known; or, when very great accuracy is required by determining the weight of water or mercury, at the standard temperature, which fills the vessel. In music, a term applied to the power and quality of the tone of a voice or instrument, or of a combination of sounds. In physics, the volume of a body may be real or apparent; the former is the portion of space actually occupied by the matter of which the body is composed, the latter is the sum of its real volume and the total volume of its pores. The real volume is invariable, the apparent volume can be altered in various ways; for instance, it diminishes as a rule on the solidification of the body. A unit of volume is the volume of the cube constructed on the unit of length.

VOLUNTEERS, citizens who of their own accord offer the state their services in a military capacity without the stipulation of a substantial reward, and without being attached to the regular army. The oldest volunteer force in Great Britain is the Honorable Artillery Company of the city of London, which received its charter of incorporation from Henry VIII. In 1794, and again in 1803, when the ambition and threats of France agitated England, the government reckoned on having nearly 500,000 efficient volunteers in arms. The number soon declined, and in 1815 the force almost ceased to exist. About 1857 a feeling of insecurity began to manifest itself in consequence of the alleged insufficiency of the national defense, and the Victoria Rifles and one or two other corps were formed. In the course of two or three years many thousands of volunteer riflemen were enrolled throughout the kingdom. Acts of Parliament relating to the force were passed in 1863, and 1869, and these with the Regulation of the Forces Act of 1871, the Volunteer Act of 1896, and orders in council issued from time to time, constitute the law relating to volunteers. There are now also corps of artillerymen, engineers, light horse, and mounted rifles as part of the volunteer force. In connection with the volunteer movement a National Rifle Association was formed in 1860, which inaugurated those great annual meetings held till 1889 at Wimbleton (since removed to Bisley, near Woking), where many thousands annually compete for prizes. This was followed by a National Artillery Association, whose annual meetings are held at Shoeburyness.

In the case of a war of magnitude the United States has always relied on its volunteer soldiery. During the Civil War, including re-enlistments, there were 2,656,533 men in the field—the great body of whom were volunteers. They were paid by the National Government, but the States appointed field and line officers. For an account of the volunteers in the United States in the World War, see UNITED STATES, section *United States in the War.*

VOLUNTEERS OF AMERICA, a religious and philanthropic body; organized from former members of the Salvation Army in March, 1896, by Commander and Mrs. Ballington Booth and consisting of several central societies and numerous self-supporting posts and outposts. The head officer is elected by the members as commander-in-chief, and by the directors as president. There are four branches of philanthropic work: (1) The sociological branch, which provides homes for destitute men. In 1920 the homes located in various cities furnished lodging for over 200,000 persons. (2) Homes for friendless young women. (3) The tenement work for the worthy poor. (4) The philanthropic branch, working among unprotected children. The Prison League is an important department of Volunteer activity. There are branches in most States. The homes for the reception of discharged prisoners are known as Hope Halls. A large majority of the ex-convicts who have been sheltered by these homes and provided with situations have made good records for themselves. There was an aggregate attendance of 927,045 persons at the hall meetings and 2,287,985 at the open air meetings.

VOLUSENUS FLORENTIUS, FLORENCE WILSON, or WOLSEY), a Scottish humanist; born near Elgin at the opening of the 16th century. Having received his early education in Scotland (probably at Aberdeen), he seems to have proceeded to the University of Paris. Like his contemporary and personal friend George Buchanan, he cultivated classical learning in preference to the logic and philosophy of the schoolmen, and attained a mastery of Latin which gives him a place with the first scholars of his time. After acting as tutor to a son (spoken of as a nephew) of Cardinal Wolsey, he eventually became principal of a school at Carpentras, near Avignon, a position he owed to the favor of Cardinal Sadoleto. In 1546, on his way home to Scotland, Volusenus died at Vienne in Dauphiné, lamented by Buchanan in a Latin quatrain, which proves the strength of their friendship. His chief work is his "The Tranquility of Mind," written in the purest classical Latin, every page of which reveals the essential refinement and moral beauty of his nature.

VOLVOX, in botany, the typical genus of *Volvocineæ*, with one species, *V. globator*. To the naked eye it resembles a minute pale green globule floating about in the water. Under the microscope it is seen to be a spherical membranous sac, studded with innumerable green points, really apertures giving exit to cilia, which enable it to roll over and over in the water. Within the sac are various dense globules, generally green in summer, but often of an orange color in autumn and early winter. They are zoöspore-like bodies, each sending a pair of cilia through separate orifices. There is a reddish brown spot and a contractile vacuole. They are found abundantly in clear pools on open commons and similar localities.

VOMER, in anatomy, a small thin bone in the median line, forming the posterior and principal portion of the partition between the nostrils in man. It exhibits many modifications in the different classes of vertebrata. In fishes an important character is the presence or absence of teeth on the vomer (that is, along the middle line of the roof of the mouth). The bone is so named from the fact that in man it bears some resemblance to a plowshare. In palæontology, a genus of *Carangidæ*, allied to *Caranx*, from the Chalk of Comen in Istria.

VONDEL, JOOST VAN DEN (von' del), a Dutch dramatic poet; born in Cologne, Germany, Nov. 17, 1587. His is the greatest name in Dutch literature, and he has often been called "The Dutch Shakespeare." He began his literary career with the drama "The Pasha," produced in 1612 before the Rhetorical Chamber, of which he was a member. He wrote the tragedy "Palamedes," and "The Amsterdam Hecuba," a free version of Seneca (1625); many translations from the classics and versions of classical originals, and the Biblical dramas, "Adam in Banishment," "Solomon," "Samson," "Noah," "Jerusalem Destroyed," "King David in Exile," "Joseph in Egypt," etc. The dramatic poem "Lucifer," the greatest of his works, is considered by many Dutch critics to be an allegorical account of the revolt of the Netherlands against Philip of Spain. His collected works, together with a life of the poet, were published at Amsterdam (1850-1869) in 12 volumes. He died in Amsterdam, in 1679.

VOODOO, or **VOUDOO**, a name given by the negroes of the West Indies and the United States to superstitious rites and beliefs brought with them from Africa, and to the sorcerer who practiced these rites for his benefit and aggrandizement.

In the Southern States of the Union there was at one time a widespread and deep-rooted belief in the power of these sorcerers. As the negroes advance in education, the belief is dying away. At one time, however, despite all efforts of religious teachers to banish the mastery of this belief from the minds of the slaves, the voodoo "doctor" was an almost omnipotent individual in the estimation of his fellows. No slave could, under any pretext, be persuaded to expose himself to the vengeance or wrath of one of these conjurors. In some cases there was a reasonable foundation for these fears; for in not a few instances has it been proven that some of the voodoos were skillful poisoners, and while the great mass of their professed art was a rank imposture, still they possessed enough of devilish skill to render them objects of wholesome dread. Their methods were as varied and variable as the winds. Anything that was mysterious, or likely to impress the ignorant mind with a feeling of terror was eagerly seized on and improved by them to their own advantage. Their services were more often invoked in destructive than in curative offices. If a negro desired to destroy an enemy, he sought the aid of the voodoo, who, in many cases, would undertake to remove the obnoxious one, and the removal was generally accomplished through the medium of poison. No doubt exists that in many cases the victim of a voodoo died from sheer fright, for whenever a negro had reason to think that he was possessed by the spell of the voodoo, he at once gave up all hope, thus hastening the accomplishment of the end toward which the energies of the sorcerer were directed. Their incantations and spell workings were always conducted with the greatest secrecy, no one being allowed to witness the more occult and potent portion of their ritual. They were frequently employed by dusky swains to gain for them the affections of their hard-hearted inamoratas, and love powders and other accessories for "tricking" constituted their stock in trade, and in some instances yielded them no insignificant revenue.

The field in which voodooism flourished best was the far South among the rice, cotton, and sugar plantations, where the negroes were not brought into contact so closely with their masters as they were farther North.

VOORHEES, DANIEL WOLSEY, an American lawyer; born in Liberty, O., Sept. 26, 1827; was graduated at De Pauw University in 1849; and admitted to the bar in 1851; began practice in Covington, Ind.; was a member of Congress in 1869-1873, and of the United States Senate in 1877-1897; served on the Senate Committee on Finance during his whole career in that body. He was also a member of the Committees on Library, Immigration, and International Expositions. The erection of the new Congressional Library was largely due to his influence. Owing to his tall and erect figure he was known as the "tall sycamore of the Wabash." He died in Washington, D. C., April 10, 1897.

VORONEZH, a province of Russia, surrounded by Tambov, Saratov, the country of Don Cossacks, Kharkov, Kursk, and Orel; area, 25,443 square miles. The surface is in general level, with gentle undulations and chalk hills of no great elevation. The principal river is the Don, with a course from N. to S. of 390 miles. It receives, near the town of Voronezh, the river Voronezh, with its affluent the united Usman and Chava. The principal crops raised are corn, potatoes, beetroot, tobacco, garden produce, and sunflowers, from the seeds of which an excellent oil is procured. In the fine pastures of Voronezh horses and cattle are largely reared. The chief exports are corn and other agricultural produce to Rostov, wool to Kharkov, cattle to Petrograd and Kharkov, and horses to most of the provinces of Russia. Pop. about 3,200,000.

VORONEZH, the capital of Voronezh, at the influx of the river Voronezh into the Don, is 310 miles N. N. W. of Rostov. Founded in 1586 as a stronghold against the Tartars, it first became important in the time of Peter I., to whom a monument was raised here in 1860. It has over 20 churches, several monasteries, and before the World War had extensive tanning industries, and carried on a large trade in corn, sugar, and oil. Pop. about 70,000.

VÖRÖSMARTY, or **VOEROESMARTY, MIHALY** (vö-rösh-mar'ty), a Hungarian writer; born in Nyek, Hungary, Dec. 1, 1800; published "King Solomon," a drama, in 1821, which was followed by a poem, "The Triumph of Fidelity" (1827); "King Sigismund," a drama (1824); "The Flight of Zalan," an epic poem; the tragedy "Kont" (1825). His narrative poems entitled "Cserhalom," and "The Enchanted Valley," established his reputation as the first Hungarian poet of his time. He was

a contributor to Kisfaludy's "Aurora," and was for several years editor of a journal called "The Repository of Science."

VORTEX, ordinarily, a whirlpool. When any portion of a fluid is set rotating round an axis a vortex is produced. Familiar examples are seen in eddies, whirlpools, waterspouts, whirlwinds, and on a larger scale in cyclones and storms generally.

VORTICELLA, or **BELL-ANIMALCULE**, a genus of stalked infusoria, having a fixed stem capable of being coiled into a spiral form, and vibratile organs called cilia fringing the bell-shaped disk or head, which are constantly in rapid motion and attract particles of food. The species are very numerous in fresh water, and are generally microscopic.

VORTIGERN, a British prince who flourished in the 5th century. According to Gildas, Bede, Ethelwerd, and the "Old English Chronicle," he invited Hengist and Horsa to assist him against his enemies the Picts and Scots. Nennius, on the other hand, represents the German chiefs as exiles who went to the island unasked. Whichever form of the story be true, it seems certain that after a short time the newcomers, re-enforced by fresh bands of their countrymen, turned against Vortigern and wrested from him the Kentish territory. Nennius is the first to bring "the beautiful daughter of Hengist" on the scene. He does not, however, name her. This is first done by Geoffrey of Monmouth (12th century), who in the main follows and expands the version of Nennius. Geoffrey calls her Rowena, or, according to some MSS., Ronwen and Ronwenna; and he is the first to tell the familiar legend of the lady making a low curtsy to Vortigern and saying, as she offered him a cup of wine, "Lauerd King, wacht heil," and how the "devil" made him so enamored of the lovely pagan that he married her that same night. There is something like unanimity in the chroniclers regarding Vortigern's character. He was at once tyrannical and lascivious; and monkish indignation (as expressed in the legend of St. Germanus) affirms that he was finally destroyed by fire from heaven. It is to be presumed that Vortigern came to a violent end in conflict with the heathen adventurers who had established themselves in his dominions.

VOS, BERT JOHN, a Dutch-American educator; born in Katwykaan Zee, Holland, Oct. 27, 1867; was educated in his native land, and graduated at the University of Michigan in 1888. He studied at Johns Hopkins University in 1888-1891 and at the University of Leipsic in 1891-1892; was instructor of German at the University of Chicago in 1892-1893; associate instructor of the same at Johns Hopkins University in 1893-1898, and associate professor from 1898-1908. In the latter year he became professor of German at Indiana University. He was the author of "Materials for German Conversation" (1900); "Monographs on Middle High German Style and Rhyme Technic"; etc. He also translated from the German "Religion of the Ancient Teutons" (1901).

VOSGES, a department in the E. of France; bounded N. by Meurthe-et-Moselle and Meuse, W. by Haute-Marne, S. by Haute-Saône, and E. by Elsass; area 2,303 square miles; pop. about 430,000. The surface is covered in the E. by the wooded summits of the Vosges Mountains, and in the W. consists of fertile undulating plains. It is watered by the Moselle, with its affluents the Moselotte, Vologne, Madon, and Meurthe; the Meuse with the Mouzon and the Vaire; and the Saône with its affluent the Coney. The industries include silk and wool spinning and weaving, embroidery and lace-making, bleaching and dyeing, and the manufacture of glass, pottery, paper, beet sugar, beer, leather, and machinery. The capital of the department is Epinal. The Vosges was the scene of the earliest fighting in France during the World War. See WORLD WAR.

VOSGES MOUNTAINS, a range of hills in the E. of France, bounding the valley of the Rhine on the W. and parallel with the Schwarzwald in Baden. They are connected in the N. with the Hardt in Rhenish Bavaria, in the S. W. with the Faucilles, the Côte-d'Or, and the Cévennes, and in the S. they unite with offsets from the Jura. The summits are usually rounded, hence called ballons, and are covered with a rich green turf, on which for six months of the year large herds of cattle graze. Their sides are clothed with forests of fir, oak, and beech. Their highest summits range from 3,000 to over 4,000 feet, culminating in Ballon de Gebweiler, 4,700 feet above the sea. In those mountains was carried on severe and almost persistent fighting during the World War.

VOSS, GERHARD JOHANN (fōs), usually styled Vossius, a Dutch philologist; born near Heidelberg, in 1577. In certain departments of archæophilology he made valuable original researches; and he was the first to indicate the historical evolution of the Latin language. Among his writings are: "Essays on Rhetoric; or, The Institutes of Oratory,"

his greatest work (1606); "The Greek Historians" (1624); "The Latin Historians" (1627); "Aristarchus; or, On the Art of Grammar" (1635); "Of Errors of Speech and Latino-Barbarous Terms" (1640); "Heathen Theology" (1642); "The Times of the Ancient Poets" (1654); "Etymology of the Latin Language" (1662). The "Correspondence of Vossius with Eminent Men" was published in 1691. He died in Amsterdam, March 19, 1649.

VOSS, JOHANN HEINRICH, a German poet; born in Sommersdorf, Germany, Feb. 20, 1751. He received a scanty school education, acted for a time as private tutor in a family, and in 1772 went to Göttingen, where he studied the classical and modern languages, and was one of the founders of the Göttingen Dichterbund, or Poet's Union. In 1775 he retired to Wandsbeck, in order to edit the "Almanac of the Muses," which he published till 1800. In 1778 he became rector of a school at Otterndorf, in Hanover, and in 1782 went as rector to Eutin. In 1805 he became professor at Heidelberg. Between 1785 and 1802 he published several volumes of original poems, the best of which is the idyl, "Luise." Among his translations that of Homer's works is undoubtedly the greatest, being the classical German version of these great epics. A translation of Shakespeare, which he undertook with his sons, was published in nine volumes in 1829. He died in Heidelberg, March 29, 1826.

VOSS, JULIUS VON, a German story-writer; born in Brandenburg, Germany, Aug. 24, 1768. His rapidity of literary production was almost without a parallel. His best story is "The Schildbürger" (The Fooltownite: 1823). He wrote a great many comedies, farces, and satirical parodies. In "The Strahlau Haul of Fish" (1822, a popular piece with songs, in the Berlin patois) he gives the first example of the Berlinese farce. He died in Berlin, Nov. 1, 1832.

VOSS, RICHARD, a German poet; called the "Tired Man"; born in Neugrape in Pomerania, Prussia, Sept. 2, 1851. Among his dramatic compositions are: "Savonarola"; "Magda"; "The Patrician Dame"; "Luigia Sanfelice"; "Father Modestus"; "Woe to the Vanquished"; "Eve"; "Betwixt Two Hearts"; "At Sedan." In narrative verse he wrote: "A Hill Asylum"; "Roman Village Tales"; "Messalina." Among his novels are: "Life Tragedy of an Actress"; "The New Romans"; "Children of the South"; "Villa Falconieri"; "Amata"; "The Sabine"; etc. He excels in description of Italian lowly life.

VOTAW, CLYDE WEBER, an American educator; born in Wheaton, Ill., Feb. 6, 1864; was graduated at Amherst College in 1888; at Yale Divinity School in 1891, and in post-graduate work at the University of Chicago in 1896; was reader and instructor in Biblical literature at the latter institution in 1892-1896, instructor of New Testament literature in 1896-1900; and was then made Professor of Biblical Greek. His publications include "Inductive Studies in the Founding of the Christian Church"; "Use of the Infinitive in Biblical Greek"; "The Primitive Era of Christianity"; "The Transition from Judaism to Christianity," etc.

VOTING MACHINE. See BALLOT.

VOW, a kind of promissory oath made to God, or to some false deity, to do or to forego something for the promotion of His glory, or to perform some act, or to dedicate to the deity something of value, on the fulfillment of certain conditions, or in the event of the vower receiving something specially desired, as recovery from illness, deliverance from danger, success in an enterprise, or the like. A vow may take the form of a solemn promise to follow out some line of conduct, or to consecrate or devote one's self, wholly or in part, for a longer or shorter time, to some act or service, or to maintain fidelity and constancy.

Vows are of two kinds, simple and solemn, the difference between them being that the latter are instituted as such, and accepted as irrevocable by the Church, and they constitute one of the marks of a religious order as distinguished from a congregation. Simple and solemn vows differ also in their effects. A simple vow makes marriage unlawful, and deprives the person who has made it of a right to use any property he may possess; a solemn vow makes marriage invalid, and takes away all dominion over property. Solemn and certain simple vows, as those of chastity and of greater pilgrimage, can only be dispensed by the Pope, or by a superior specially delegated for the purpose; but most of the simple vows can be dispensed by the bishop of the diocese in which the person who has made the vow resides.

VOWEL, a sound uttered by simply opening the mouth or vocal organs; a sound produced by the vibration of the vocal chords. The pitch or tone of a vowel is determined by the vocal chords, but its quality depends on the configuration of the mouth or buccal tube. A, i, and u are by philologists called the primitive vowels, and from them all the various vowel sounds in the Aryan languages

have been developed. A vowel differs from a consonant in that the former can be pronounced by itself, while a consonant requires the aid of a vowel to be sounded with it. While there are only 5 vowel characters, yet there are 14 vowel and 5 diphthongal sounds in English.

VOYAGEUR, a traveler; specifically applied in Canada to a class of men employed by the fur companies in transporting goods by the rivers and across the land to and from the remote stations of the Northwest. They are nearly all French Canadians or half-breeds.

V-PUG, the *Eupithecia coronata*, a pug moth. The fore wings are green with numerous black and pale markings, the most conspicuous of which is a V-shaped black mark, whence the name. The caterpillar feeds on the traveler's joy, the agrimony, the golden rod, and the wild angelica.

VULCAN, in mythology, the Roman god of fire and the patron of all metallic handicrafts; the son of Jupiter and Juno, and identical with the Greek Hephæstus. Being extremely ugly and deformed, Juno, ashamed to own such a child, dropped him from heaven, when the infant god, falling into the sea, was rescued and adopted by Thetis, who kept him till nine years of age. He was then restored to his parents. Soon after his return to Olympus, Vulcan took his mother's part in one of the quarrels between husband and wife; Jupiter, enraged at Vulcan's audacity, flung him from heaven. After traveling a whole day, the youth alighted on the island of Lemnos, breaking his ankle in the fall; here he raised forges and workshops, and became the chief of artificers; some poets, however, fix his workshop on Olympus, another on Etna, where Cyclops were his ministers and chief assistants, by whose aid he fabricated all the great works attributed to him. He fashioned Pandora, and had Venus given him for his wife, by whom he was father of Cupid. Vulcan is represented bearded, covered with dust and soot, and blowing the fires of his forges, or else in the act of forging Jove's thunderbolts.

VULCAN, in astronomy, the name given to a planet, imaginary or real, between the Sun and Mercury. On March 26, 1859, M. Lescarbault, a village physician of Orgères, Eure-et-Loire, France, saw, or fancied that he saw, a small dark planet-like body pass across the sun's disk. In September the alleged discovery reached Leverrier, who eagerly grasped it, as he had previously come to the conclusion that the motions of Mercury were affected by the perturbation of a planet between it and the sun. He even went so far as hypothetically to calculate the elements of the new planet. M. Liais stated that he was examining the sun at the very moment of M. Lescarbault's supposed discovery, and was certain that no dark body passed across the disk. The planet was called by anticipation Vulcan, but its existence still remains unconfirmed though M. Porro and M. Wolf of Zurich reported seeing its transit in 1876.

VULCANITE, a hard and non-elastic variety of vulcanized rubber, used for making combs, dental plates, and numerous other objects. It contains from 30 to 60 per cent. more sulphur, and is subjected to a higher and more prolonged heat in curing than ordinary vulcanized rubber. It is of a brownish-black color, is hard and tough, cuts easily, is susceptible of a good polish, and is not affected by water or any of the other caoutchouc solvents. It evolves a considerable amount of electricity when rubbed, and is hence much used in the construction of electric machines. In petrology, a name sometimes given to pyroxene.

VULCANIZATION, the act or process of vulcanizing, or of treating caoutchouc or india-rubber with some form of sulphur, to effect certain changes in its properties; as to render it insensible to atmospheric changes, increase its durability, and adapt it for various purposes in the arts. This was originally effected by dipping the rubber in melted sulphur and heating it to nearly 300°. Several other methods have been employed. The substance thus formed is elastic at all temperatures, cannot be dissolved by the ordinary solvents, and resists the effects of heat within a considerable range of temperature. Vulcanized india-rubber is largely used for many useful purposes, as for water-proofing cloth, for boots, shoes, mats, toys, belting, buffers, wheel-tires, washers, valves, pipes, fire-hose, medical and surgical appliances, etc.

VULGATE, the edition of the Latin Bible which, having been sanctioned by the usage of many ages in the Roman Church, was pronounced "authentic" by the Council of Trent. The name was originally given to the "common edition" of the Septuagint used by the Greek Fathers, and thence transferred to the "Itala" or the "Old Latin" version of both Old and New Testaments current during the first centuries in the Western Church. It finally passed to the present composite work, which gradually took the place of the "Old Latin." The relation of the component parts of this venerable version to the original texts will be best

understood by a description of the work of St. Jerome, from whose hand it mainly proceeded. In the time of Pope Damasus, toward the end of the 4th century, the text of the "Old Latin," the origin of which is lost in obscurity, had fallen into considerable confusion. It was a very literal representation of the Greek, rude in style and full of provincialisms. Every one, it seems, who had a smattering of Greek, thought fit to make alterations; and so great became the variety of recensions that it is still a matter of dispute whether there was not at their basis a number of independent translations rather than a single version often retouched.

To remedy the evil Jerome, at the request of Damasus, A. D. 382, undertook a revision of the New Testament. He corrected the Gospels thoroughly, though with great caution, and the rest more cursorily, with the aid of Greek codices which were then reputed ancient and trustworthy. The critical value of the result as a primary witness to the Greek text in its best state in the 4th century has recently been generally recognized. Jerome next turned his attention to the Psalms. He at first merely corrected the Latin from the "common edition" of the Greek, and this revision, called the "Roman Psalter," completed in 383, was introduced by the Pope into the Roman liturgy, and is to this day used in the Ambrosian or Milan rite and in St. Peter's at Rome. Shortly after Jerome made a more thorough revision by the aid of Origen's Hexapla; and it is this, the so-called "Gallican Psalter," which is now read in the Vulgate.

After the death of Damasus, Jerome was induced by the urgency of private friends to undertake a more serious task, a new translation of the Old Testament from the Hebrew. This he accomplished in Palestine, where he had perfected himself in Hebrew with the assistance of learned Jews, during the years A. D. 390-405. To this work he added a free translation of the books of Tobit and Judith from the Chaldee version of the original Hebrew, now lost. The other books of the Greek canon, afterward incorporated with the rest of his work—viz. Wisdom, Ecclesiasticus, and Maccabees—were left by him untouched; and these, with, in a somewhat less degree, the Psalms and the New Testament, are of special value to the linguist, preserving as they do, quite apart from their Grecisms, many lexical and grammatical forms, relics of the dialect of the people, which are not found in the classical or literary language. The new translation met at first with much opposition. The Fathers had been accustomed to regard the Septuagint as an inspired version, and Jerome's departure from that version appeared to be a dangerous innovation. It won its way by degrees, and by force of its intrinsic worth. Gregory the Great says that in his time the Roman See made use of both versions. Venerable Bede speaks of St. Jerome's as "*our* edition"; and soon the "Old Latin" fell into disuse and neglect, so that, notwithstanding the keen researches of scholars, a complete copy of the pre-Hieronymian Old Testament cannot now be made up from the surviving fragments.

In the course of the Middle Ages the Vulgate necessarily contracted some corruption. Charlemagne, with the aid of Alcuin, took pains to procure and disseminate a pure text; and later on, with the same object, the University of Paris and some of the religious orders compiled "Correctoria," or lists of common errors with their corrections. The numerous editions printed in the 15th century were of no critical value, but in the first half of the following century several attempts were made to provide a revised and authoritative text, the most important editions being those of R. Stephens (1528, and later) and of the Louvain theologians (first under the care of Henten of Malines in 1547, and secondly with the co-operation of Lucas of Bruges and the printer Plantin, 1574). Meanwhile the carrying out of the Tridentine decree, that the Vulgate should be printed as correctly as possible, was undertaken by the Popes, who appointed commissions of cardinals and learned men for the purpose. Nearly 40 years passed, however, before their labors were brought to a close. Sixtus V. in 1590 first issued the long-expected work, together with a bull in which he ordered this edition to be received as "true, lawful, authentic, and unquestioned"; but he had of his own judgment made many important changes in the readings proposed by the commission, and these met with so little approval that the edition was after Sixtus' death almost immediately recalled, the work again submitted to a papal congregation for revision, and finally issued in 1592 as the authoritative text by Clement VIII. This Clementine Bible differed from the Sixtine in some 3,000 readings. A few errors of the press were corrected in a second impression in 1593; and others, again, in the third and last official impression of 1598, to which standard all copies should be conformed.

VULPIUS, CHRISTIAN AUGUST (vŏl'pe-us), a German writer; born in Weimar, Germany, Jan. 23, 1762. He was a brother-in-law of Goethe, under whose direction he became secretary of

the court theater at Weimar. He published: "Rinaldo Rinaldini" (1797), a robber romance; "Dramatic Histories of Former Times"; and a number of dramatic works. He was subsequently first librarian and overseer of the cabinet of coins at Weimar. He died in Weimar, June 26, 1827.

VULTURE, any member of the family *Vulturidæ* included among the birds of prey in the sub-order *Falcones*. By some naturalists the family is sub-divided into the Old-World vultures (*Vulturinæ*) and the New-World vultures (*Sarcorhamphinæ*), while by others the latter, which are distinguished by a perforated nostril and the absence of an "after-shaft" to the feathers, are regarded as a distinct family, *Cathartidæ*. In all the vultures the head and neck are more or less bare, the beak is long and curved only at the tip; the legs and feet are large and powerful, but the toes and claws are relatively weak. They are thus well-adapted for walking and feeding on the ground, but are unable to carry off their prey like the eagles and hawks. The wings are very strong, and their powers of swift and sustained flight are remarkable. Vultures are widely distributed throughout temperate and tropical regions, and the general habits of the various species are very similar, though they differ greatly in their choice of haunts. Thus one species frequents the rocky peaks of the Alps and another sweeps over the great plains of Africa; the king vulture dwells alone with his mate in the densest parts of the South American forests, while Pharaoh's chickens pick up a living as street scavengers in the towns of the East.

The chief food of the vultures is carrion; they rarely attack any living animal unless under great stress of hunger, when a wounded or feeble lamb or hare is sometimes killed. There has been much discussion as to whether vultures scent or sight their prey, but experiment has shown, apparently conclusively, that their sense of smell is not unusually acute, and they rely chiefly on their extreme keenness of vision, while the sudden descent of one bird serves as a signal to many others. When a carcass is discovered by one, others arrive quickly on the scene from all points of the compass, though none may have been visible a few minutes before. Tearing off the skin with their powerful beaks they gorge themselves greedily on the flesh and entrails till nothing is left but the skull and larger bones. Smaller birds only venture to look on and watch the stray morsels which may be let fall, but in the neighborhood of towns the vulture's claim is sometimes—not often successfully—disputed by wandering dogs. After a full meal vultures may remain without food for many days. The young birds, which are carefully tended for several months, are fed by regurgitation of food from the crop of the parents.

One of the commonest European species is the griffin vulture (*Gyps fulvus*), which occurs in Spain, among the Alps, and in the Mediterranean region generally. It makes a rough nest of branches and grasses, usually in a cavity or on a ledge of an almost inaccessible cliff. One or at most two eggs are laid early in March, and the parents share the labor of rearing and tending the young. The adult bird measures 3½ feet in length; the general color is light brown with black markings, and there is a white ruff on the lower part of the neck. The eared vulture (*Otogyps auricularis*), an inhabitant of Africa, received its name from folds of skin on the head resembling earlappets. The Egyptian vulture (*Neophron percnopterus*) is often called Pharaoh's chicken from its frequent occurrence in ancient Egyptian hieroglyphics, where it is used as an emblem of parental love. It is very common throughout northern Africa and Persia, and breeds frequently in the S. of Europe. More than one specimen has been killed in England. The Egyptian vulture is raven-like in form; its wings are pointed, its bill slender, and half covered with a naked cere. The adult bird is little over 2 feet in length; its plumage is white with black wing-feathers. The young birds are dark brown.

VYÁSA ("the distributor or arranger"), the traditionary author of the Vedas, the Mahabharata, the Puranas—in fact, of nearly all ancient Sanskrit religious literature. It is evident that in this name is mythically embodied the historical fact that these works at some period underwent a regular and authoritative recension. It merits notice that the Greek name of Homer is capable of being analyzed with a similar result.

VYATKA, or **VIATKA**, a large province in European Russia; area, 59,329 square miles; pop. about 3,700,000, comprising many Tartar tribes and some 50,000 Mohammedans. The products are corn, rye, barley, oats, flax, and hemp. Forests of fir, oak, elm and birch are extensive. Before the World War it had manufactures of woolens, linens, potash, leather, copper, firearms, anchors, gun carriages, etc. The capital, of the same name, is a well-built town, containing 17 churches and a cathedral with an altar of solid silver, and is the commercial center of the province.

W

W, w, the 23d letter of the English alphabet. It takes its form and its name from the union of two V's the character V having formerly the name and force of U. The name "double u" is not, however, a very suitable one, being given to the letter from its form of composition, and not from its sound. In the Anglo-Saxon alphabet W had a distinctive character of its own, the modern letter being adopted in the 13th century. W represents two sounds: (1) The distinctive sound properly belonging to it, being that which it has at the beginning of a syllable, and when followed by a vowel, as in was, will, woe, forward, housework, etc.; (2) at the end of syllables, in which position it is always preceded by a vowel, it has either no force at all (or at most only serves to lengthen the vowel), as in law, paw, grow, lawful, etc.; or it forms the second element in a diphthong, as in few, new, now, vow, etc., being in such cases really a vowel, and equivalent to the u in bough, neutral, etc. It is formed by opening the mouth with a close, circular configuration of the lips, the organs having exactly the same position as they have in pronouncing the oo in foot. W is hence often spoken of as a vowel; but it is not so, as may be seen by comparing woo, wood, and woman, in which w is not equivalent to oo.

WAAG (vag), a large river of Hungary, rising in the Carpathian Mountains, and after a course of 200 miles, joining the Danube at Komorn.

WAAL, THE, a branch of the Rhine, the main waterway of the larger Rhine vessels, which above Arnhem branches off into the province of Gelderland, and unites near Workum with the Maas.

WABASH, a city and county-seat of Wabash co., Ind.; on the Wabash river, and on the Cleveland, Cincinnati, Chicago and St. Louis and the Wabash railroads; 75 miles N. E. of Indianapolis. It is the trade and shipping center of a rich agricultural region. Here are a court house, a street railroad and electric light plants, a hospital, National and other banks, and several daily and weekly newspapers. The city has manufactories of carriages, shoes, flour, hats, paper, woolen goods, etc. Pop. (1910) 8,687; (1920) 9,872.

WABASH, a river of the United States, which rises in the N. W. of Ohio, winds across Indiana, forms the boundary between Indiana and Illinois, and falls into the Ohio, of which it is the largest N. tributary, after a course of 550 miles. It is navigable for steamboats to Lafayette.

WABASH COLLEGE, an educational non-sectarian institution in Crawfordsville, Ind.; founded in 1832; reported at the close of 1919: Professors and instructors, 25; students 219; president, G. L. Mackintosh, LL. D.

WACE, ROBERT, a Norman-French trouvère, calling himself simply Master Wace; born in the island of Jersey about 1120. His celebrated works are two long romances, the "Roman de Brut" (Brutus), and the "Roman de Rou" (Rollo), both in Norman-French. The "Roman de Brut" is in octosyllabic couplets, is presumably founded on Geoffrey of Monmouth's chronicle, and is of commanding literary importance as the source, or supposed source, from which many subsequent poets drew their Merlin and King Arthur tales. The "Roman de Rou," mostly octosyllabic also, is a chronicle of the Norman dukes. He died about 1180.

WACO, a city and county-seat of McLennan co., Tex.; at the confluence of the Bosque and Brazos rivers, and on the Missouri, Kansas and Texas, the Gulf, Colorado and Santa Fe, and other railroads; 95 miles N. E. of Austin. It contains State and Federal court houses, Baylor University (Bapt.); the Academy of the Sacred Heart (R. C.), the Paul

Quinn College (A. M. E.), United States Government building, public library, National, State, and private banks, and several daily and weekly newspapers. Here also are waterworks, gas and electric lights, street railroads, etc. Waco is the chief interior cotton entrepôt of Texas. It has flour mills, foundries, and manufactories of cotton and woolen goods, ice, lumber, iron, brass, and various other articles. Pop. (1910) 26,425; (1920) 38,500.

WADAI, or **WADAY**, formerly an extensive and powerful negro state in the central Sudan; between Kanem and Bagirmi in the W. and Darfur in the E.; area, 170,000 square miles; pop. estimated at 1,000,000. It consists principally of an elevated plateau, very fertile in some parts, producing abundantly maize, millet, indigo, cotton, etc. Ivory and slaves are also largely dealt in. The inhabitants are warlike, and their sultan exercises tributary rights over several neighboring settlements. The prevailing religion is Mohammedan. Its sovereignty passed to France in 1903. Capital, Abeshr.

WADDING, LUKE, an Irish ecclesiastic; born in Waterford, Ireland, Oct. 16, 1588; after studying theology at the Lisbon Jesuit Seminary, entered the Franciscan order (1607), and became Professor of Divinity in the University of Salamanca. As chaplain to an embassy despatched to treat concerning the doctrine of the Immaculate Conception, he went to Rome in 1618, and settling there, founded the Irish Franciscan College of St. Isidore (1625), acted as papal councilor in the great controversy with the Jansenists, whose tenets he shared at first, but presently renounced; and was procurator of his order (1630-1634) and vice-commissary (1645-1648). He refused a cardinal's hat, and died in Rome, Nov. 18, 1657, having himself composed the "Annals of Minor Ordinances" (8 vols. 1625-1656; new ed. 22 vols. 1731-1747), and "Scriptures of Minor Ordinances" (1660; new ed. 1806), and edited Calasio's posthumous "Biblical Concordance" (4 vols. 1621) and the works of Duns Scotus (12 vols. 1620).

WADDINGTON, GEORGE, an English educator; born Sept. 7, 1793; son of Rev. George Waddington, vicar of Tuxford, Nottinghamshire. A brilliant university career at Cambridge was rewarded by a fellowship in Trinity College; and after several years of foreign travel he received the vicarage of Marsham in Yorkshire. In 1840 he was made dean of Durham, and in the following year warden of Durham University. His chief works are: "Journal of a Visit to Some Parts of Ethiopia" (1822); "A Visit to Greece in 1823 and 1824" (1825); "Present Prospects of the Greek or Oriental Church" (1829); "History of the Church from the Earliest Ages to the Reformation" (13 vols. 1835); "History of the Reformation on the Continent" (3 vols. 1843). He died July 20, 1869.

WADDINGTON, WILLIAM HENRY, a French statesman; born in Paris, Dec. 11, 1826; was educated at Rugby and Trinity College, Cambrige, and took a classical first-class, with a chancellor's medal, in 1849. He returned to France, and devoted himself to the study of antiquities, extending his journeys to Asia Minor, Syria, and Cyprus. In 1865 he was elected to the Academy of Inscriptions and Belles Lettres. In February, 1871, he was returned by Aisne to the National Assembly, giving a steady support to Thiers. From 1876 till 1885 he sat as senator for Aisne. He served as minister of Public Instruction in 1873 (for a few days only) and in 1876-1877 as minister of foreign affairs, plenipotentiary at the Berlin Congress (1878), president of the Council (1879), and was ambassador at London from 1883 to 1893. He died Jan. 13, 1894.

WADE, BENJAMIN FRANKLIN, an American statesman; born in Springfield, Mass., Oct. 27, 1800. About 1821 he removed to Ohio, where he was employed as a school teacher for several years. He studied law and was admitted to the bar in 1827. In 1837 and 1841 he was elected State Senator; in 1847 was chosen presiding judge of the 3d Judicial District of Ohio; and in 1851, 1857, and 1863 was elected United States Senator. He was an advocate of the Homestead bill, voted for the repeal of the Fugitive-Slave Law, and opposed the Nebraska-Kansas bill of 1854. During the Civil War he was prominent in public affairs. In the session of 1861-1862 he was appointed chairman of the Joint Committee on the Conduct of the War. He also served as president of the Senate and acting Vice-President of the United States. At the Republican National Convention, in Chicago, May 21, 1868, he received more votes on the first four ballots for the nomination for Vice-President than any other candidate; but failed to obtain the nomination. Excepting to serve as a commissioner to Santo Domingo, he took no prominent part in public affairs after 1869. He died in Jefferson, O., March 2, 1878.

WADE, JAMES F., an American military officer; born in Ohio, April 14,

1843; entered the Union army as 1st lieutenant in the cavalry in 1861; served with distinction throughout the Civil War; was brevetted colonel and Brigadier-General of volunteers in 1865; commissioned major of the 9th Cavalry, U. S. A., in 1866; promoted colonel in 1891, and Brigadier-General in 1897; and in May, 1898, was appointed a Major-General of volunteers. After the war with Spain, in which he took an active part, he was placed at the head of the American Cuban Evacuation Commission; in January, 1899, became military governor of Cuba. He was made major-general in 1903; served in the Philippines, 1901-1904; from 1904 to 1907 commanded the Atlantic Division. He was retired in the latter year.

WADE, SIR THOMAS FRANCIS, an English dipomatist; born in 1818; entered the army in 1838, and served in China and other parts of the East. He was appointed interpreter to the garrison at Hong Kong (1843), assistant Chinese secretary (1847), vice-consul at Shanghai (1852), and Chinese secretary at Hong Kong (1855). His intimate knowledge of the Chinese character and language led to his being attached to Lord Elgin's mission to China (1857-1859), and as Chinese secretary he accompanied his lordship to Peking on his special mission (1860). In 1862 he became Chinese secretary and translator to the British legation in China; acted as chargé d'affaires at Peking (1864-1865 and 1869-1871), and in the last of these years was appointed envoy extraordinary, minister plenipotentiary, and chief superintendent of British trade in China. In November, 1875, he was made a K. C. B. for his success in diplomacy and in furthering the interests of British commerce. He was the author of "Tziü-Erk Chi" (1867), a progressive manual of the Chinese tongue. He died at Cambridge, July 31, 1895.

WADHAM COLLEGE, a college connected with Oxford University, England; founded in 1610 by Dorothy, widow of Nicholas Wadham, of Mayfield, Somersetshire, England, for a warden, 15 fellows, 15 scholars, 2 chaplains, and 2 clerks. There are now 8 fellows, 18 scholars, and some 100 under-graduates. Wadham College, whose library is rich in rare Spanish books, presents to 10 livings.

WADI (Arabian, "ravine"), in Palestine and Arabia, either a river or river valley, or the basin of a torrent. Rehan thinks this word was adopted by the Greeks and corrupted into oasis. It has passed into the Spanish guad, with which many of the Spanish river names begin; thus Wadi-l-Kebir (Arab. "great river") appears as Guadalquivir, Wadi-l-hajarah ("river of stones") as Guadalaxara. The ravines of Malta commonly go by the name of vyed or wied, a corrupted form of wadi.

WADLIN, HORACE GREELY, an American statistician; born in Wakefield, Mass., Oct. 2, 1851; was educated at public and private schools, and studied architecture in Salem and Boston, Mass.; was an architect in the latter city in 1875-1879. He then became special agent for the Massachusetts Bureau of Statistics of Labor, and in 1888 was made its chief. He held a seat in the Massachusetts Legislature in 1884-1888; was supervisor of the United States census in 1890 and 1900, and of the State census in 1895. His publications include: "Reports on the Statistics of Labor of Massachusetts" (12 vols. 1888-1901); Annual Statistics of Manufactures of Massachusetts (14 vols. 1886-1901); "The Decennial Census of Massachusetts" (7 vols. 1895); "Carroll, Davidson Wright, a Memorial" (1911).

WADSWORTH, ELIOT, an American public official, born in Boston, in 1876. He graduated from Harvard in 1898. He was a member of the firm of Stone & Webster, electrical engineers, from 1907 to 1916. In the latter year he resigned to become vice-president of the Central Committee of the American Red Cross, and served in this capacity until 1919. He directed the work of the Red Cross in the United States and in France during the World War, and received decorations for his services from several foreign governments, as well as the Distinguished Service Medal of the United States Government.

WADSWORTH, JAMES SAMUEL, an American military officer; born in Geneseo, N. Y., Oct. 30, 1807; was educated at Harvard and Yale; studied law with Daniel Webster, and was admitted to the bar in 1833. He enlisted as a volunteer in the Union army early in 1861; was appointed a Brigadier-General in August; and became military governor of the District of Columbia in March, 1862. He was engaged in the battles of Fredericksburg, Chancellorsville, Gettysburg, and the Wilderness as the commander of a division, and was killed in the last named battle, May 6, 1864.

WADSWORTH, JAMES WOLCOTT, JR., a United States Senator from New York. He was born at Geneseo, N. Y., in 1877, and graduated from Yale in 1898. He engaged in stock raising and

general farming and conducted a large ranch in Texas. From 1911 to 1913 he took an active part in politics and was a member of the New York Assembly from 1905 to 1910 acting as speaker from 1906 to 1910. He was elected United States Senator from New York in 1914, and was re-elected in 1920 by a majority of over 400,000. During his term in the Senate, he was chairman of the Military Committee, and had much to do with the passage of the Military Organization Bill in 1920.

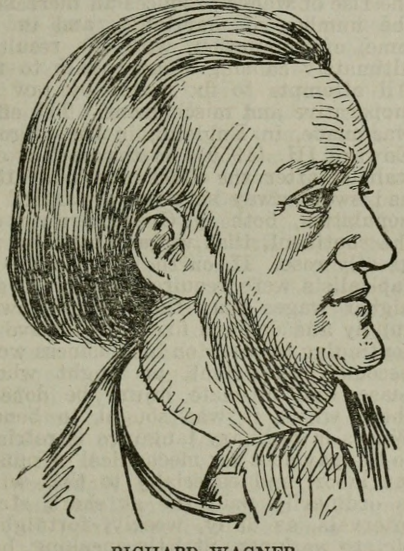
WAGER, in law, a promise to give money or money's worth on the happening of an uncertain event. Every contract of insurance is in the nature of a wager, but such contracts are permitted, because they serve useful purposes. Sporting wagers were enforceable at common law unless they were of an indecent or otherwise improper character; thus, a wager on the life of Napoleon was held void, as tending to weaken patriotism and to encourage the assassination of a foreign sovereign. In England, by an act of 1845, all agreements by way of wagering are rendered null and void as between the parties; but the enactment does not apply to any subscription for a prize to be awarded to the winner in any lawful sport. Where a person employs an agent to bet for him, or to enter into transactions contrary to Leeman's act (passed to prevent gambling in shares) no action can be brought on the bet or bargain made by the agent; but if the agent pays, the principal remains liable to indemnify him. These rules apply to all wagers; but there are certain forms of agreement which are not only void but illegal. Acts were passed in 1665 and 1710 to discourage betting on games, and an act of 1835 provides that any security given for a gambling debt shall be void, and that money paid to the holder of such security may be recovered by action. As the loser of a bet cannot be legally compelled to pay, the debt is only what is called a debt of honor; but sporting men are usually more scrupulous in paying such debts than in the meeting the claims of their lawful creditors. By the criminal law penalties are imposed on persons who keep or use houses for betting purposes, and magistrates may authorize the police to break into such houses and arrest persons found therein. Persons who win money by cheating at cards, etc., are liable to be indicted for obtaining money by false pretenses; persons playing or betting in the street may be punished as rogues and vagabonds. In the law of Scotland wagers are treated as *pacta illicita*, and debts incurred by wager are not enforced. In the United States gaming contracts are in most States void, and money paid or property delivered on such considerations may generally be recovered. See GAMBLING.

WAGES, the payment for work done or services performed; the price paid for labor; the return made or compensation paid to those employed to perform any kind of labor or service by their employers; hire, pay, recompense, need. The rate of wages is determined by the ratio which the capital, for the productive use of which labor is sought, bears to the number of laborers seeking that kind of employment. When the capital increases more rapidly than the laboring population of the country, wages rise; when it increases more slowly, they fall. But in the United States and most countries, the rise of wages produces an increase in the number of marriages, and in due time, of population, with the result of ultimately causing wages again to fall. All attempts to fix wages by law are inoperative and mischievous. The effort was made, in England, in the reign of Edward III. (1350), on the part of capitalists, after the black death, in 1346, had swept away so large a part of the population, both in Great Britain and the continent, that wages naturally and greatly rose. If, on the other hand, the capitalists were required by law to give higher wages than the natural law of supply and demand fixed, his motive for continuing to carry on his business would become less potent, or might wholly cease, and ultimate injury be done to those whom it was sought to benefit. Wages in ordinary language is retricted to the payment for mechanical or muscular labor, and especially to that which is ordinarily paid for at short, stated intervals, as daily, weekly, fortnightly, etc., to workmen. Strictly speaking, however, the term wages comprehends as well the pay of officers, the fees of barristers, medical men, etc., the salary of clerks, the stipends of clergymen, as the remuneration for mechanical labor. See MINIMUM WAGE: UNEMPLOYMENT, etc.

WAGNER, COSIMA, the widow of Richard Wagner. She was born in 1841, the daughter of Liszt, the composer. She first married Hans von Bülow, a musician, and one of Richard Wagner's most intimate friends, but was divorced from Von Bülow in 1870 and married Wagner, whom she assisted greatly in his musical writing. Following his death she organized a small staff and maintained the Bayreuth Theater, where

festival performances were conducted at regular intervals. She died in 1918.

WAGNER, (WILHELM) RICHARD, a German operatic composer; born in Leipsic, May 22, 1813. In 1836 he was conductor at Magdeburg, and after spending some time in Königsberg, Dresden, and Riga successively, he went to Paris in 1841. Here he composed or completed his "Rienzi" and "Der fliegende Holländer" (Flying Dutchman). "Rienzi" obtained for him the post of assistant conductor (with Reissiger) at Dresden. His "Tannhäuser" appeared in 1845. He spent the season of 1855 in London as conductor of the Philharmonic Society's concerts. In all his operas the words of the libretto are of his own composition, and far superior, from the poetic standpoint, to the ma-



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jority of works intended for such use. They are treated in a declamatory style, supported by most original harmonies and instrumentation in accordance with their dramatic significance. Wagner advanced the importance of the orchestra accompaniment till it is almost the prime factor in the performance of his works. He was acknowledged supreme master of instrumental effects. It must be admitted, however, that, in his later works especially, his scoring is not unfrequently cruel to the human voice. Wagner was a musical revolutionist and reformer in many ways affecting the opera. Like other reformers and iconoclasts in other spheres and times, his methods and theories will doubtless be modified by the future. Meantime he may safely be ranked as the greatest musician who has arisen since Beethoven, and his probable influence on future operatic compositions can scarcely be overestimated. The following is a list of dates of first performances of his remaining dramatic works: "Lohengrin" (1850); "Tristan and Isolde" (1865); "Meistersinger" (1868)); "Das Rheingold" (1869); "Die Walküre" (1870); "Siegfried" (1876); "Die Götterdämmerung" (The Dusk of the Gods) (1876); "Parsifal" (1882). Of the above the "Walküre," "Siegfried" and "Götterdämmerung" constitute Wagner's greatest work, the so-called "Trilogie," three chapters of one story each for separate evenings. The "Rheingold" is the preface to these three, wherein the events occur whose far-reaching consequences are developed in the subsequent evenings. The four works constitute the "Ring of the Nibelungen." Wagner's ambition was to produce a distinctively national (German) music drama. Therefore his choice and adaptation of scenes from the great, almost prehistoric, epic of Germany—the "Nibelungenlied," the German "Iliad." He died in Venice, Feb. 13, 1883.

WAGON, in ordinary language, a four-wheeled vehicle for the transport of goods, freight and produce. The ordinary wagon is a strong, heavy vehicle, drawn by two (or sometimes more) horses yoked abreast. The fore wheels are smaller than the hind wheels, and their axle is swiveled to the body of the vehicle, so as to facilitate turning. Most wagons are supplied with strong springs, on account of the weight of the vehicle, and to make up for the absence of the steadying power of the horses, who expend their force in pulling only, the weight being distributed over the four wheels. A vehicle on four wheels of equal diameter is of lighter draught than one in which the fore wheels are smaller than the hind wheels unless the load is distributed on the wheels in proportion to their diameter. Common examples of the wagon are the brewer's dray, the agricultural wain, and the railway truck. Carriers' wagons are generally provided with wooden bows, over which can be stretched a covering of heavy canvas or other material, so as to protect the goods carried from rain, etc. The ends of the bows are inserted in staples on each side of the vehicles, so that cover and bows can be removed when not required. See MOTOR VEHICLE.

Wagon, in goldbeating, a tool having four edges of cane mounted in a frame, and used to trim the edges of gold-leaf

to a size for a book; that is, about 3¼ inches on a side. The cane is used in preference to steel, as the gold does not adhere to it.

WAGRAM, a village of Lower Austria; on the left bank of the Rossbach; 12 miles N. E. of Vienna; famous for the great battle in 1809 between the French under Napoleon and the Austrians under the Archduke Charles, each about 15,000 strong. The battle was well contested, but the result gave Napoleon a decisive victory, which was followed up by an armistice and the treaty of Schönbrunn (Oct. 14).

WAGTAIL, a name of birds included in the family of the warblers, and so termed from their habit of jerking their long tails when running or perching. They inhabit meadow lands and pastures, frequent water pools and streams, are agile runners, and have a rapid flight. The food consists of insects. Their nests, built on the ground, contain from four to six eggs. These birds belong to both Old and New Worlds and migrate S. in winter; but the pied wagtail (*Motacilla Yarrelliii*) is a permanent resident in Great Britain. It is almost wholly black on the upper parts; the under parts are grayish white. Other representative varieties, distributed principally over the European continent and the East, are the white wagtail (*M. alba*); the gray wagtail (*M. campestris* or *Boarula*); and the yellow or Ray's wagtail (*M. sulphurea* or *Budytes Rayi*).

WAHABI, or **WAHABEE**, in the plural in Mohammedanism, a sect founded by Abdul Wahhab, born toward the end of the 17th century, near Der'aiyeh, the capital of Nejd, in Arabia. During the Saracen period the Mohammedan sacred places were in Arab custody. When the Saracen was succeeded by the Turkish power they passed over into Turkish keeping. It is obligatory on every Mussulman who can afford the expense, to make a pilgrimage to Mecca at least once in his life. The Arabs were greatly scandalized by the moral laxity of some of the pilgrims, and it became painfully apparent that even the best of them had largely departed from the purity of the faith, according divine honors to Mohammed, elevating tradition to the same level as revealed scripture, and quietly ignoring any precept of the Koran which required self-denial for its performance. Abdul Wahhab felt it a duty to make a determined effort to restore Mohammedanism to its pristine purity, and the most earnest Moslems gradually became his followers. Converting to his views Mohammed Ibu Saud, the powerful Sheikh of Der'aiyeh, whose daughter he married, he induced his father-in-law to draw his sword for the establishment of a pure Mohammedan theocracy.

The Bedouins flocked to his standard; the towns of Arabia, less inclined to adopt the new faith, had to be conquered. The Pasha of Bagdad, A. D. 1748 and 1749, somewhat retarded, but did not permanently arrest their progress. In A. D. 1765 (1172 of the Hegira) the father-in-law died, and on June 14, 1787 (A. H. 1206), the revivalist or reformer. The former was succeeded by his son, Abdul-Aziz. In 1797 the Wahabees pillaged the town and tomb of Husein; in 1803 they captured Mecca, and in 1804 Medina, where they plundered the tomb of Mohammed himself. By this time Abdul-Aziz had been succeeded by his son Saud, by whose orders the Khootba (public prayer) was no longer allowed to be offered in the name of the Sultan. With the exception of the territory subject to the Imam of Muscat, all Arabia now submitted to the Wahabees. They also captured some Arabic towns on the coast of Persia, and Wahabee pirates infested the Persian Gulf. In 1809 these pirates were severely punished by the British, in conjunction with the Imam of Muscat. The same year Mehemet Ali, Pasha of Egypt, prepared to attack them. In 1812 he took Medina, and in 1813 Mecca. In 1816 Ibrahim Pasha, the son of Mehemet Ali, assumed the command of the Egyptian troops and entering Arabia, took Der'aiyeh in 1818, and capturing Abdullah, son and successor of Saud, sent him to Constantinople, where he was beheaded. In 1827, 1834, 1838, and 1839 the Wahabees attempted to excite insurrections, and required continual vigilance from Egypt. In 1862 and 1863 Palgrave found them numerous in Arabia.

WAIKATO, the principal river of the North Island of New Zealand; flows first into Lake Taupo, and then out of it N. to Manakan harbor, with a total course of 170 miles. Between the Upper Waikato, Lake Taupo, Mount Ruapehu, and the W. coast lies the mountainous and picturesque "King Country," occupied mainly by Maoris under their king, who till 1884 resolutely opposed the survey or settlement by Europeans of the lands within their *aukati* or frontier.

WAINWRIGHT, JONATHAN MAYHEW, an American clergyman; born of American parents in Liverpool, England, Feb. 24, 1793; was graduated at Harvard College in 1812; studied theo-

logy and was ordained in the Protestant Episcopal Church in 1818; settled in New York City in 1819; and was there rector of Grace Church in 1821-1834. Three years later he was made assistant in charge of St. John's Chapel, and remained there till November, 1852, when he was consecrated provisional bishop of New York. He was one of the founders of the University of New York, and was deemed one of the most eloquent pulpit orators of his time. His publications include "Four Sermons on Religious Education" (1829); "Lessons on the Church" (1835); "The Pathway and Abiding Places of Our Lord, Illustrated in the Journal of a Tour Through the Land of Promise" (1851); "The Land of Bondage: being the Journal of a Tour in Egypt" (1852); etc. He died in New York City, Sept. 21, 1854.

WAINWRIGHT, RICHARD, an American naval officer, born in Washington, in 1849. He was graduated from the United States Naval Academy in 1868, having previously served in the Civil War as ensign. He was promoted to be lieutenant commander in 1894, commander in 1899, captain in 1903, and rear admiral in 1908. He served in various bureaus and in command of several vessels, and from 1887 to 1890 was on duty at the Naval Academy. In 1896-1897 he was chief of the Intelligence Office and was executive officer of the Maine until she was blown up at Havana harbor, on February 15, 1898. During the Spanish-American War he took part in the destruction of Admiral Cervera's squadron off Santiago, Cuba, July 3, 1898. For his service in this and other engagements, he was advanced ten numbers in rank. From 1900 to 1902 he was superintendent of the United States Naval Academy. He was a member of the General Board, from 1904 to 1907. He commanded the 2d division of the Atlantic Fleet in 1908-1909, and of the 3d division, in 1909-1910. In the latter year he was appointed aid for operations to the Secretary of the Navy. He was retired by operation of the law in the following year.

WAIT, one of a body of minstrels or musical watchmen attached to the households of kings and other great persons, who paraded an assigned district sounding the hours at night. Many cities and towns, both English and foreign, encouraged and licensed their waits, Exeter among other places having a regular company as early as the year 1400. As a plural, the word was sometimes used to describe those who acted as the town musicians, but did not do duty as watchmen, and any company of performers when employed as serenaders. The instruments used were a species of hautboys, called also shawms, and from their use "waits." Also one of a band of persons who promenade the streets during the night and early morning about Christmas or New Year, performing music appropriate to the season.

WAITE, MORRISON REMICH, an American jurist; born in Lyme, Conn., Nov. 29, 1816; was graduated at Yale University in 1837; studied law and practiced in Ohio; member of the Ohio legislature 1849-1850; in 1871 was appointed one of the attorneys to represent the United States before the tribunal of arbitration at Geneva; nominated by President Grant to be chief justice of the United States Supreme Court in 1874, and was unanimously confirmed by the Senate. He died in Washington, D. C., March 23, 1888.

WAITZEN, a town of Hungary, comitat of Pest, on the Danube; 23 miles N. of Pest. It is an episcopal see; has a cathedral built in 1761-1777 on the model of St. Peter's at Rome; four other Catholic churches and one Protestant.

WAKATIPU, a picturesque lake in the South Island of New Zealand; area, 112 acres. Queenstown and Glenorchy, on the borders of the lake, are favorite tourist resorts, on account of the magnificent mountain scenery in the vicinity.

WAKE, a term corresponding originally to vigil, and applied to a festival held on the anniversary of the day on which the parish church was consecrated and dedicated to a saint. A *lyke* or *lich wake* (Anglo-Saxon, *lic*, a corpse) is the watching of a dead body by night by the relatives and friends of the deceased. The practice, once general, is now confined to the lower Irish classes, and frequently accompanied by scenes much out of keeping with the sad occasion.

WAKEFIELD, the capital of the West Riding of Yorkshire, England, on the Calder at a convergence of railways, 9 miles S. S. E. of Leeds, 27 S. S. W. of York, and 19 N. W. of Doncaster. In 1888 it was constituted the seat of a bishopric. Its cathedral, formerly the fine Perpendicular parish church, enlarged and reconsecrated in 1329, and again enlarged about 1470, was restored in 1857-1886 from designs by Sir G. G. Scott, and has a tower and spire 227 feet high. On the eight-arch bridge over the Calder is an interesting chapel founded in 1357 by the townsmen of Wakefield, a building in the beautiful flowing Decorated style; it also was re-

stored in 1847. At the grammar school, chartered in 1591, and removed to new buildings on a different site in 1855, were educated Dr. Radcliffe, Archbishop Potter, the Benedictine Cressy, and Bentley, the first two of whom were natives. The town hall, French Renaissance in style, was erected in 1880; and other buildings are the corn exchange; fine art institute, Clayton hospital, and lunatic asylum. Though not the great "clothing town" it was formerly, Wakefield still has considerable manufactures of woolens, worsteds, and hosiery, as also of agricultural implements, machinery, etc. The chief event in the history of Wakefield is the Yorkist defeat in the Wars of the Roses, on Dec. 31, 1460. Pop. about 55,000.

WAKEFIELD, a town including several villages, in Middlesex co., Mass. It is on the Boston and Maine railroads. Its industries include rattan goods, knit goods, pianos, stoves, shoes, etc. It has a town hall, a public library, and a home for aged women. Pop. (1910) 11,404; (1920) 13,025.

WAKEFIELD, EDWARD GIBBON, an English colonist; born in London, March 20, 1796; was in 1826 imprisoned for abducting a young lady and marrying her at Gretna Green. During his imprisonment he studied colonial questions with zeal, and after his liberation assisted in the colonization of South Australia. He was private secretary to Lord Durham in Canada in 1838, but is best known for his services to New Zealand colonization as managing director of the New Zealand Association. He was one of the founders of the High Church colony of Canterbury, where he died May 16, 1862.

WAKEFIELD, GILBERT, an English clergyman; born in Nottingham, England, Feb. 22, 1756; was educated at Jesus College, Cambridge, of which he became fellow. He took orders, but renounced the Anglican communion, labored as classical tutor in dissenting academies at Warrington and Hackney, lay two years in Dorchester jail for a so-called seditious libel in answer to Bishop Watson, for which his political friends consoled him with a gift of $25,000. He published editions of Bion and Moschus, Vergil, Horace, and Lucretius; "Christian Writers of the Three First Centuries on the Person of Christ" (1784), left unfinished; "Inquiry into the Expediency and Propriety of Social Worship" (1791), the necessity for which he denied; "An Examination of Paine's Age of Reason" (1794); and "Silva Critica," a collection intended to illustrate the Scriptures from the stores of profane learning (1789-1795). He died in London, Sept. 9, 1801.

WAKE FOREST COLLEGE, an educational institution in Wake Forest, N. C.; founded in 1834 under the auspices of the Baptist Church; reported at the close of 1919: Professors and instructors, 30; students, 465; president, W. L. Poteat, LL. D.

WALCHEREN, an island of Holland; province of Zeeland, at the mouth of the Scheldt. It is level, below high-water mark, very fertile, populous, and prosperous. It contains the thriving towns of Flushing, Middelburg (capital), and Veere. On July 13, 1809, the British expedition under Lord Chatham (elder brother of Pitt) landed near Veere, and took it, Middelburg, and Flushing, but had to retire the December following, after losing 7,000 men by marsh fever.

WALCOTT, CHARLES DOOLITTLE, an American scientist, born in New York Mills, N. Y., in 1850. He was educated in the public schools of Utica, N. Y., and received honorary degrees from a number of American and foreign universities. He early in life began to devote himself to geological research. In 1876 he became assistant in the New York State Survey. In 1879 he became assistant geologist of the United States Geological Survey, making the Cambrian rocks and faunas of the United States his especial subjects of inquiry, the results of which he presented before the International Geological Congress, at London, in 1888. From 1889 to 1893 he was paleontologist in charge of invertebrate paleontology; from 1893 to 1894 geologist in general charge of geology and paleontology; from 1894 to 1907 director of the United States Geological Survey. In 1892 he became honorary curator of the department of paleontology at the National Museum, and in 1907 secretary of the Smithsonian Institution, Washington, D. C. From 1902 to 1905 he was also secretary of the Carnegie Institution, Washington, being also a member of its Board of Trustees. From 1905 to 1907 he was director of the United States Reclamation Service. He was also at various times a member and an officer of the National Academy of Sciences, and of many other domestic and foreign scientific associations. Besides many reports and papers on geological and paleontological subjects, he also wrote "The Trilobite"; "Paleontology of the Eureka District"; "The Cambrian Faunas of North America"; "The

Fauna of the Lower Cambrian or Olenellus Zone"; "Pre-Cambrian Fossiliferous Formations"; "Correlation Papers"; "Cambrian Geology and Paleontology"; "Cambrian Brachiopoda"; "The Cambrian Faunas of China"; "The Cambrian and Its Problems in the Cordilleran Region"; "Pre-Cambrian Algonkian Algal Flora"; "Discovery of Algonkian Bacteria"; "Evidences of Primitive Life"; "Appendages of Trilobites."

WALD, LILLIAN D., an American sociologist, born in Ohio, in 1867. She was educated in private schools, at the New York Hospital Training School for Nurses, and at the Woman's Medical College. In 1893 she founded, and since then has been the president and head worker of the Henry Street (New York City) Settlement. She was also the originator, in 1902, of the work of the school nurses in New York City, this work representing the first municipalization of school nursing in the world. It was chiefly due to her efforts that, in 1908, the Federal Children's Bureau came into being. She was the delegate of the Federal Children's Bureau to the International Conference at Cannes, France, and the United States delegate to the Woman's International Conference at Zurich, in 1919. She was also a member and at times an officer of many charitable societies and institutions, most of which were connected with work on behalf of children. She wrote besides many magazine articles, pamphlets, and reports, "The House on Henry Street" (1915).

WALDECK, a former principality in the W. N. W. of Germany; comprises the former county of Waldeck, girt by the Prussian provinces of Westfalen and Hessen-Nassau, and that of Pyrmont lying apart between Lippe, Hanover, Braunschweig, and Westfalen; area, 433 square miles; pop. about 65,000. Waldeck is among the highest districts between the Rhine and Weser, the greatest elevations being the Hegekopf (2,750 feet), near Stryck, the Ettelsberg (2,703), and Pön (2,519). The country, picturesquely diversified with vale and upland, plain and forest, is watered by the Weser, Eder, Werbe, Itter, Aar, Diemel and Twiste. At Niederwildung are chalybeate springs, and at Pyrmont are famous saline and iron springs. The chief crops are rye, oats, and potatoes. The woods cover 105,142 acres. The principal export is the mineral water of Wildung, which is sent as far as Japan and China. The princely house of Waldeck dates from the 12th century and till the end of the 14th possessed Swalenberg and Sternberg. George Victor (born 1831) negotiated a "Treaty of Accession" in 1867, by which he transmitted the administration to Prussia, himself retaining merely nominal power. The treaty was renewed in 1888. Waldeck was proclaimed a republic in November 1918, still remaining, however, under the administration of Prussia.

WALDECK-ROUSSEAU, PIERRE MARIE, a French statesman; born in Nantes, France, Dec. 2, 1846; he studied law and practiced in Rennes till 1879, when he was elected to the Chamber of Deputies as a Gambettist. He was Minister of the Interior in the cabinet of 1881-1882, and again during the Ferry administration in 1883-1885. He continued as deputy from Rennes till his election to the Senate in 1889. After the fall of the Dupuy ministry in 1899 he was appointed premier by President Loubet, and under many difficulties formed a new and greatly strengthened ministry. As a lawyer he was engaged as counsel for Count de Lesseps in the Panama case, and was a Dreyfus "revisionist." He died Aug. 10, 1904.

WALDEMAR I., called THE GREAT, King of Denmark; born in 1131, succeeded Eric V. in 1147. His reign was illustrated by expeditions against the pirates of the Baltic, and he compelled Magnus VI., King of Norway, to sign a humiliating treaty. He died in 1181. WALDEMAR II., called the Victorious, younger son of the preceding, succeeded his brother Canute VI., in 1202. He made many warlike expeditions into Sweden, Norway, and Germany, created a powerful navy, and revised the laws of his kingdom. He died in 1241. WALDEMAR III., eldest son of the preceding, was regent from 1219 to 1231. WALDEMAR IV., third son of Christopher II., was in Bavaria at the death of his father in 1333. In 1340-1344 he recovered part of his kingdom by force of arms, and obtained some further successes against Sweden in 1353 and 1357; eventually, however, he was glad to obtain peace by making some sacrifices; he died in 1376.

WALDENSES, a famous Christian community which originally grew out of an antisacerdotal movement originated by Peter Waldo, of Lyons, France, in the second half of the 12th century. A rich merchant, pious and unlearned, he caused the New Testament and a collection of extracts from the Fathers to be translated into Romaunt, and, naturally failing to find the apostolic simplicity in the ecclesiastical condition of the time, sold his movable goods for the support

of the poor, and devoted himself to preaching the truth to the people by the wayside. Everywhere he found eager listeners, and was followed by groups of simple and earnest persons of both sexes who did their best, even to their dress, to carry out the apostolic ideal, loving to bear the name of the Poor Men of Lyons. The tenets ascribed to them in the earliest accounts are chiefly that oaths even in a court of justice are not allowable, that homicide is under no circumstances justifiable, that every lie is a moral sin, that all believers are capable of priestly functions, and that the sacraments are invalidated by uncleanness of life in the officiating priest.

We find at first no special doctrines that could be condemned as heretical, and even in later days, as Mr. Lea points out, the documents of the Inquisition constantly refer to "heresy and Waldensianism," the former meaning Catharism. The archbishop of Lyons forbade them to preach, but in vain; Pope Alexander III. gave them a modified approval, but Lucius III. anathematized them at Verona in 1184, and Innocent III. at the fourth council of the Lateran in 1215. But it was impossible to compel silence, for the missionary zeal of these sincere enthusiasts was boundless, and their influence quickly grew. Alonso II. of Aragon ordered them to quit his dominions in 1194, and in southern France they became involved in the common destruction of the Albigenses, though their quarrel with the Church differed from that of the latter in relating to matters of practice rather than of doctrine.

But under persecution their divergences from the Church naturally grew ever the greater, and we find that gradually, though never uniformly, they came to repudiate the invocation of the Virgin and saints, transubstantiation, and purgatory with all its consequences. Thus the Waldensian martyrs at Strassburg in 1212 made no distinction between laity and priesthood, while at the same time both the French and Lombardian Waldenses held that the Eucharist could be celebrated only by an ordained priest, and it was at that time still the latter only who believed it invalid if the priest was living in sin. Yet they themselves maintained a kind of order of preachers (*perfecti*), living in voluntary poverty and celibacy, in contradistinction to the ordinary *credentes*. And by some accounts there was a kind of hierarchy among the *perfecti*, a theory which gains some support from the frequent use of such terms as *majoralis*, *magnus magister*, *major*, and *minor*. Their morality was austere, and we find the very inquisitors acknowledging their chastity, sobriety, truthfulness, and industry. Their crowning offenses were their paramount regard for Scripture and the unresting proselytism of their preachers, who went abroad two by two, ostensibly practicing some calling, as pedlers or tinkers, but ceaselessly exhorting the faithful in sequestered places, hearing confessions, and administering absolution. Their principal seats were the slopes and fastnesses of the Cottian Alps, E. in Piedmont, W. in Provence and Dauphiné.

After the Cathari were finally crushed they supplied the chief work that remained to the Inquisition in France. They had grown strong among the poorer class in Languedoc, with schools, a good organization, and missionaries reputed to have skill in medicine. They next spread into Lorraine, Burgundy, Franche Comté, Narbonne, and the mountains of Auvergne. We find Bernard Gui burning them at Toulouse in 1316, and by this time persecution had done its perfect work as well in refining their piety as in completing their estrangement from Rome. Their doctrine of non-resistance made it easy to harry and confiscate their property, yet we find the victims often too poor to pay for the wood that burned them. During the years 1336-1346 especially they were severely harassed; 12 were burned in front of the cathedral at Embrun in 1348. Popes Clement VI. and Urban V. stimulated the zeal of the Inquisition, and we read how the great inquisitor, François Borel, burned 150 at Grenoble in one day in 1393. Gregory XI. urged on the unhappy work in Provence, Dauphiné, and the Lyonnais, and in 1375 the prisons were crowded with far more prisoners than could be fed, and charity was actually asked for them by the Church.

During the Great Schism they contrived to escape, and after the Council of Constance the Hussites engaged for a time all the energies of the Church. We hear, however, of the persecutions again in 1432 and later years, and by this time, says Mr. Lea, so completely had the Waldenses monopolized the field of misbelief in the public mind of France that sorcery became popularly known as *vauderie*, and witches as *vaudoises*. Sixtus IV. tried to stir up Louis XI. in vain; but Charles VIII. was more docile, and Pope Innocent VIII. was able in 1488 to organize a crusade against them in both Dauphiné and Savoy. The valley of Pragelato, Val Cluson, and Freyssinières were ravaged pitilessly with fire and sword and wholesale confiscations, many *barbes* (pastors) were burned, and in Val Louise the poor fugitives were

smoked to death in their caves. Louis XII. stopped the proceedings, with consent of Pope Alexander VI., whose son Cæsar Borgia had just received the duchy of Valentinois. Their remnants continued to cherish their own faith, more or less under disguise of Catholicism, till they finally merged with the Calvinists after the Reformation.

The Cathari never made much way in Germany, but on the other hand the Waldenses became strong. Some were burned at Strassburg in 1212, and especially in the diocese of Passau in the second half of the same century there was much prosecution. Yet by the close of the century they had become very numerous, often succeeding in escaping notice by their quietness and outward conformity. In 1392 the Archbishop of Mainz persecuted them vigorously, burning 36 at Bingen together. At Steyer in Pomerania, in 1397, over 100 of either sex were burned. Yet they were not extirpated, and remained strong, especially on the confines between Austria and Moravia. In 1467 they united themselves with the famous Bohemian Brethren. The Waldensians on the French side of the Cottian Alps in 1530 opened negotiations with the Swiss and German reformers, and in 1532 a five days' synod at Chanforans in the valley of Angrogne drew up articles of agreement.

The 18th century was not a favorable age for persecution, yet even at its close the Waldenses could hold no office nor real estate, nor have physicians of their own faith. Napoleon allowed their Church a constitution, but this Victor Emmanuel abolished in 1814, though two years later, urged by England and Prussia, he issued a milder edict. Meantime they prospered—Col. John C. Beckwith (1789-1862), who had lost a leg at Waterloo, through reading Dr. Gilly's "Visit to the Valleys of Piedmont" (1832), settld among the people for the last 35 years of his life, marrying a peasant girl, and succeeded in establishing as many as 120 schools. At last in 1843 Charles Albert gave the Waldenses equal political and religious rights, and since that time their progress has been constant if not rapid.

WALDERSEE, ALFRED HEINRICH CARL LUDWIG, COUNT VON, a German military officer; born in Potsdam, Germany, April 8, 1832; entered the army in 1850; served with distinction in the campaign of 1860 and in the Franco-Prussian War; became Major-General in 1876, general in 1880, quartermaster-general in 1881, Lieutenant-General in 1882, general of cavalry in 1888; and succeeded Von Moltke as chief of the general staff of the German army in August, 1888. In 1895 he was promoted Field-Marshal, and in 1900 was chosen commander of the allied armies in China. His wife, MARY, born in New York City, Oct. 3, 1837, was a daughter of David Lee; spent her early years in Paris with her sister Josephine, and there married Prince Frederic of Schleswig-Holstein-Sonderburg-Augustenburg-Noër, in 1864. On the death of her husband in July, 1865, she returned to Paris, where she remained till 1870, when she removed to Württemberg, Germany. In 1871 she married Count von Waldersee. She was credited with much influence in the German court, and with having brought about the marriage of Emperor William II. with the Princess Augusta Victoria. He died in Hanover, March 5, 1904.

WALDSTEIN, SIR CHARLES, a British archæologist; born in New York City, March 30, 1856; was educated at Columbia University and graduated at the University of Heidelberg in 1875; was made Professor of Fine Arts at King's College, Cambridge, England, in 1893; served as director of the American School of Classical Studies in Athens in 1889-1895; and was professor there in 1895-1897. He had charge of the excavations of the American Archæological Institute at Eretria, Platæa, Heraion of Argos, etc. He was the author of "Excavations at the Heraion of Argos"; "Balance of Emotion and Intellect"; "Essays on the Art of Phidias"; "The Work of John Ruskin"; "The Study of Art in Universities"; "The Expansion of Western Ideals and the World's Peace"; "Greek Sculpture and Modern Art" (1914).

WALES, a principality in the S. W. of the island of Great Britain, which since Edward I. gives the title of Prince of Wales to the heir-apparent of the British crown; area, 7,466 square miles; pop. about 2,100,000. It is divided into 12 counties. As a whole it is very mountainous, particularly in the N., where Snowdon, the culminating point of south Britain, rises to the height of 3,571 feet; and it is intersected by beautiful valleys, traversed by numerous streams, including among others the large river Severn. It is rich in minerals, particularly coal, iron, copper, and even gold, and to these Wales owes its chief wealth. The coal trade is most extensive, and Cardiff is the largest coal port in the world. In 1915 almost 40,000,000 tons of coal were produced in Wales. Iron, steel, and copper works are also on a large scale. Besides the mineral industries, there are considerable woolen manufactures, especially of flannel, coarse

cloth, and hosiery. The Welsh have many strange customs and peculiar superstitions. They are remarkably fond of poetry and music, and their language is said to be peculiarly adapted to poetical effusions. Their ancient language is, however, falling fast into disuse throughout the principality, more especially the S. part. Family distinction is held in great estimation. The aboriginal Celtic race still inhabits some parts of the country. Llewellyn ap Gryffydd was the last prince who exerted himself for the independence of Wales. In 1282 he was subdued by Edward I., and fell on the field of battle. From that time, Wales has been annexed to the English crown; but the union was not complete till the reign of Henry VIII., when the government and laws were assimilated with those of England. See ENGLAND: GREAT BRITAIN.

WALES, PRINCE OF, the title applied to the eldest son of the English sovereign since the time of Edward I. The holder of the title in 1921 was Prince Edward Albert Christian George Andrew Patrick David, oldest son of George V. He became Prince of Wales upon reaching his majority in 1910.

WALEWSKI, ALEXANDRE FLORIAN JOSEPH COLONNA, DUKE DE, a French statesman; born in Walewice, Poland, May 4, 1810; was educated at Geneva, and entered the Polish patriot army, but later retired and devoted himself to literature. He wrote: "A Word on the Question of Algiers" (1837); "The English Alliance" (1838); a comedy, "The School of the World; or, The Coquette Without Knowing It" (1840). He died in Strassburg, Sept. 27, 1868.

WALFISH BAY, a body of water on the S. W. coast of Africa, in lat. 22° 50′ S. It possesses a safe anchorage, but is without fresh water, and its shores are barren and desolate in the extreme. Fish are very abundant, and it was formerly a favorite whaling ground, whence its name. Valuable deposits of copper and lead exist some distance inland, but are not yet worked. The climate is almost rainless, and is fairly healthy except in the hot months, when low fever prevals. It forms a part of the Cape province of South Africa.

WALHALLA, a magnificent and sumptuously decorated Doric octostyle peripteral temple, on the Danube, near Ratisbon; built between 1830-1842, as a national pantheon, consecrated to celebrate Germans of all walks of life. The idea of the erection is derived from the Walhalla, or Valhalla, the ancient paradise of Odin and the Scandinavian deities.

WALKE, HENRY, an American naval officer; born near Portsmouth, Va., Dec. 24, 1808; was appointed to the navy in February, 1827; and took part in the Mexican War as executive officer on the brig "Vesuvius," where he engaged in the capture of Vera Cruz and in the operations against Tabasco, Túxpan, and Alvarado. Immediately prior to the outbreak of the Civil War in 1861, he took measures which prevented the occupation of Fort Pickens by the Confederates. He served with distinction throughout the war; commanded the squadron that co-operated with Grant at the battle of Belmont and covered the retreat of the National army; participated in the battle of Fort Henry, for which he received the thanks of the Secretary of War, of Congress, and of the State of Ohio; opened the battle of Fort Donelson and was the last to retire from the front line of battle; took part in the bombardment of Island No. 10, when he voluntarily ran the gantlet of the Confederate batteries and captured the batteries below the island; and commanded the second division of the fleet at the battle of Grand Gulf, silencing the main fort on Point of Rocks. Subsequently he dispersed the Confederates under General Taylor at Simmsport, La.; blockaded the mouth of Red river; commanded the "Sacramento" in search of the "Alabama"; blockaded the "Rappahannock" at Calais, France, till the close of the war; and intercepted her when she escaped to British waters under the British flag. On April 26, 1871, he was retired at his own request to hasten the promotion of junior officers. He died in Brooklyn, N. Y., March 8, 1896.

WALKER, AMASA, an American political economist; born in Woodstock, Conn., May 4, 1799. He was for many years engaged in commercial pursuits; from 1842 to 1848 lectured on political economy at Oberlin College; in 1848 became a member of the Massachusetts Assembly, and in 1849 of the Senate; in 1851-1852 was Secretary of State, and in 1862-1863 was Republican member of Congress from Massachusetts. From 1858 to 1869 he was lecturer on political economy at Amherst College. He was one of the editors of the "Transactions" of the Agricultural Society of Massachusetts (7 vols. 1848-1854). He wrote: "Nature and Uses of Money and Mixed Currency" (1857); and "The Science of Wealth" (1866). He died in North Brookfield, Mass., Oct. 29, 1875.

WALKER, FRANCIS AMASA, an American educator; born in Boston, Mass., July 2, 1840; was graduated at Amherst College in 1860; served throughout the Civil War, distinguishing himself on various fields. On Aug. 25, 1864, he was captured at Ream's Station and for a short time was detained in Libby prison; was promoted colonel Dec. 23, 1862, and received the brevet of Brigadier-General of volunteers March 13, 1865; was superintendent of the 9th census in 1870-1879; became Professor of Political Economy in the Sheffield Scientific School of Yale University in 1873; and in the latter year accepted the presidency of the Massachusetts Institute of Technology, where he served till his death, Jan. 5, 1897. He was the author of "The Indian Question" (1876); "Money" (1878); "Money, Trade, and Industry" (1879); "Political Economy" (1883); "History of the Second Army Corps" (1886); etc.

WALKER, FREDERICK, an English painter; born in London, May 24, 1840; studied at the Royal Academy (1858), and designed for illustrations for the "Cornhill Magazine" and "Once a Week" (1860-1864). Some of these drawings he reproduced in water-color, in which medium he produced a number of exquisite pictures. In 1863 he exhibited his first oil painting, "The Lost Path," at the Royal Academy, and was made an associate R. A. in 1871. His best works in oil are "The Bathers," and "By the Plough." He died in St. Fillans, Scotland, June 4, 1875.

WALKER, JOHN, an English author; born in Devonshire; was educated at Exeter College, Oxford, graduating M. A. in 1699. He became rector of St. Mary-the-More, Exeter. His famous work is entitled "An Account of the Sufferings of the Clergy who were Sequestered in the Grand Rebellion" (folio, 1714). The work itself was called forth by Calamy's "Abridgement of the Life of Mr. Baxter," nearly half of which is the famous "Particular Account of the Ministers who were Ejected by the Act of Uniformity," and Calamy himself replied to it in "The Church and Dissenters compared as to Persecution" (1719). Withers, a dissenting minister of Exeter, also made a reply, and still more Neal in his "History of the Puritans." Walker estimated at over 7,000 the number of clergy "imprisoned, banished, and sent a-starving." He died in Exeter, about 1730.

WALKER, JOHN GRIMES, an American naval officer; born in Hillsboro, N. H., March 20, 1835; was graduated at the United States Naval Academy in 1856; promoted lieutenant in 1858; and at the outbreak of the Civil War in 1861 was assigned to duty in the blockading service. During the war he participated in the capture of New Orleans and the operations against Vicksburg in the summer of 1862; commanded the "Baron de Kalb" of the Mississippi squadron in several engagements; had charge of a naval battery at the siege of Vicksburg; was executive officer on board a gunboat at the capture of Wilmington N. C., and took an active part in several other engagements. He was secretary of the Lighthouse Board in 1873-1878; chief of the Bureau of Navigation in 1881-1889; promoted commodore in 1889; commanded the "Squadron of Evolution" in 1889-1894; and in the latter year, on his promotion to rear-admiral, was assigned to the Pacific station; being particularly charged with the maintenance of peace and good order in the Hawaiian Islands. He was chairman of the Lighthouse Board in 1895-1896; head of the deep water harbor commission for Southern California; and president of the Isthmian Canal Commission in 1899. He died Sept. 16, 1907.

WALKER, ROBERT JAMES, an American financier; born in Northumberland, Pa., July 23, 1801; was graduated at the University of Pennsylvania in 1819; practiced law in Pittsburgh, Pa., in 1822-1826, and in the latter year removed to Mississippi. There he entered politics and was elected to the United States Senate in 1836 and 1840. While in the Senate he opposed the distribution of the surplus revenue, advocating, instead, its application to public defenses; introduced the celebrated "Homestead" bill; sustained the treaty for the suppression of the slave trade; and drafted and supported the resolution recognizing the independence of Texas. On the accession of James K. Polk to the presidency in 1845, he was appointed Secretary of the Treasury, and continued in that office till March, 1849, during which period he prepared and carried through the tariff bill of 1846, various loan bills, the warehousing system, the Mexican tariff, and a bill to organize the Department of the Interior. Subsequently he was governor of Kansas, in which office he defeated the attempt to force corrupt measures on the territory; was actively occupied in the support of the National Government prior to the Civil War, advocating the immediate re-enforcement of Southern fortifications and the maintenance of the Union by force; and in 1863 was sent as financial agent of the United States to Europe, where he negotiated

the sale of $250,000,000 in 5-20 bonds. On his return in 1864 he applied himself to the practice of law and to literary work, writing extensively for the "Continental Review." He died in Washington, D. C., Nov. 11, 1869.

WALKER, SEARS COOK, an American astronomer; born in Wilmington, Mass., March 28, 1805; was graduated at Harvard College in 1825; taught school for several years near Boston and in Philadelphia, and actively engaged in scientific work. He prepared a set of parallactic tables for the latitude of Philadelphia, which greatly facilitated the process of computing the phases of an occultation in 1834; planned the organization of an observatory in connection with the Philadelphia high school in 1837; published a valuable paper on the periodical meteors of August and November, 1841; and in 1845 received an appointment in the Washington Observatory, where on Feb. 2, 1847, four months after the discovery of the planet Neptune, he indentified that planet with a star observed by Lalande in May, 1795. From 1847 till his death he had charge of the longitude computations of the United States Coast Survey, and in this connection he developed with Professor Bache the method of determining differences of longitude by telegraph, which was first put into successful operation in 1849. He died in Cincinnati, O., Jan. 30, 1853.

WALKER, WILLIAM, an American adventurer; born in Nashville, Tenn., May 8, 1824, studied law in Nashville, and medicine in Germany. In July, 1853, he organized an expedition against Sonora, Mexico, but was compelled to surrender to the United States commander at San Diego, Cal. In 1855, at the instigation of American speculators, he went to Nicaragua with 62 followers, and in conjunction with a small native force defeated a Nicaraguan army of 540 men at Rivas. He then took the city of Grenada, and through a treaty with Gen. Ponciano Corral, his antagonist, he was made Secretary of War and Commander-in-Chief. He established a government, but was driven from power, and surrendered to the United States authorities in May, 1857. In June, 1860, he invested Honduras; was captured by the commander of the British man-of-war "Icarus"; and was delivered to the Honduras authorities. After being tried by court-martial he was shot in Trujillo, Honduras Sept. 12, 1860. He was the author of "The War in Nicaragua" (1860).

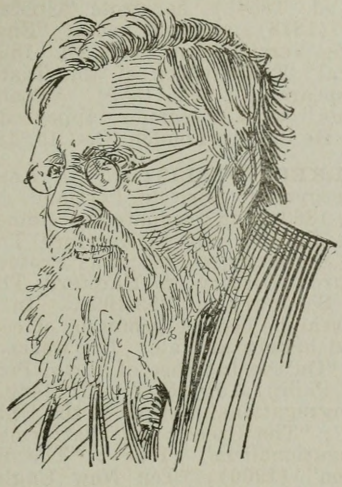
WALKER, WILLIAM SIDNEY, a British poet; born in Pembroke, Wales, Dec. 4, 1795. He was a fellow of Trinity College, Cambridge (1820-1829), becoming blind during that time. Besides translating a "Collection of Latin Poets" (new ed. 1854)), he wrote "Gustavus Vasa" (1813), an epic poem; "Shakespeare's Versification" (3d ed. 1859); "Critical Examination of the Text of Shakespeare" (3 vols. 1859). "Poetical Remains," with a memoir, appeared in 1852. He died in London, Oct. 15, 1846.

WALKER, WILLISTON, an American clergyman; born in Portland, Me., July 1, 1860; was graduated at Amherst College in 1883 and at Hartford Theological Seminary in 1886; was Professor of Church History in Hartford Theological Seminary in 1889-1901. In the latter year he became professor of ecclesiastical history at Yale. His works include: "On the Increase of Royal Power under Philip Augustus"; "History of the Congregational Church in the United States"; "The Creeds and Platforms of Congregationalism" (1893); "The Reformation" (1900); "Ten New England Leaders" (1901); "History of the Christian Church (1918).

WALKING STICK, in entomology, a popular name for any species of the family *Phasmidæ*, from the fact that they are destitute of wings, and resemble dry twigs so closely that, except for their motion, it is difficult to believe they are really alive. They are natives of subtropical and the warmer temperate regions, and walk gently among the branches of trees, reposing in the sun, with their long, antennæ-like legs stretched out in front; called also animated sticks, walking straws, etc.

WALLACE, ALFRED RUSSELL, an English naturalist; born in Usk, Monmouthshire, England, Jan. 8, 1823; was educated at Hertford grammer school. He spent many years in traveling, especially in South America and the Asiatic Islands. His observation of animal life early led him on the track of natural selection, and before Darwin gave his famous work to the world he had published "Speculations on the Origin of Species." Wallace differed from Darwin on the subject of the intellectual, moral, spiritual nature of man, and claimed to be at once a Darwinian and an anti-materialist. He was president of the Land Nationalization Society and a member of various scientific bodies. The Royal Society of London awarded him the royal medal in 1868, and the Geographical Society of Paris the gold medal in 1870. He wrote: "Travels on the Amazon and Rio Negro"; "The Malay Archipelago"; "Tropical Nature";

"Geographical Distribution of Animals"; "Natural Selection" (1870); "Miracles and Modern Spiritualism" (1874); "Australasia" (1879); "Island Life"



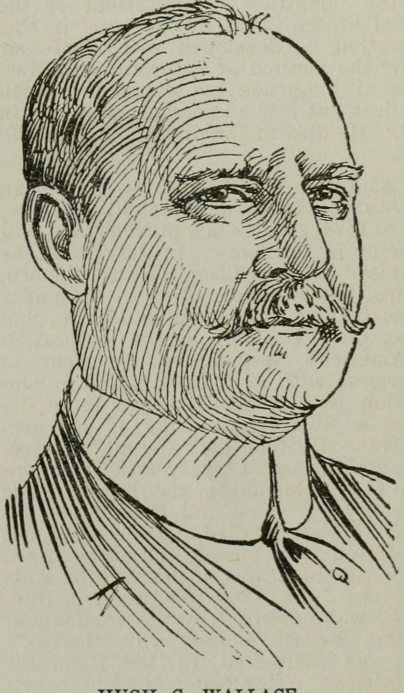
ALFRED RUSSELL WALLACE

(1880); "Land Nationalization" (1882); "Bad Times" (1885); "Darwinism" (1889); "The Wonderful Century" (1898); and many scientific and popular papers. He died in 1913.

WALLACE, HENRY CANTWELL, an American editor and public official, born in Rock Island, Ill., in 1866. After graduating from Iowa State College of Agriculture and Mechanic Arts in 1892, he engaged in farming and in the breeding of pure-bred live stock. He was also professor of dairying at the Iowa State College, from 1893 to 1895. After having been connected with several farm papers, he became, in 1895, manager and assistant editor of "Wallace's Farmer," and from 1916 was editor of this paper. He was a member of the executive committee of the United States Live Stock Industrial Commission. During the World War he was a member of the National War Work Council of the Y. M. C. A., chairman of the Iowa War Work Council. He became Secretary of Agriculture in the cabinet of President Harding, assuming office on March 4, 1921.

WALLACE, HUGH CAMPBELL, an American diplomat, born at Lexington, Mo., in 1863. He was educated in public and private schools of his native town, and under private tutors. He was a member of the Democratic National Committee in 1892, 1896, and 1916; a delegate-at-large from the State of Washington to the Democratic National conventions of 1896 and 1912; and took a prominent part in the national campaigns of 1892, 1912, and 1916. In February, 1919, President Wilson appointed him United States Ambassador to France.

WALLACE, JOHN FINDLEY, an American civil engineer, born at Fall River, Mass., in 1852. He was educated at Monmouth (Ill.) College and at the University of Wooster, and received honorary degrees from Monmouth College and from Armour Institute. From 1871 to 1876 he was assistant United States engineer on the upper Mississippi river, and in connection with the improvements of the Rock Island rapids. Beginning with 1878 and until 1904 he was connected in various capacities with several mid-Western railroads, the greater part of this time being spent in the service of the Illinois Central railroad, of which he was general manager from 1901 to 1904. In the latter year he became the first American chief engineer of the Panama Canal. In 1905 he was made an Isthmian Canal Commissioner and vice-president and general

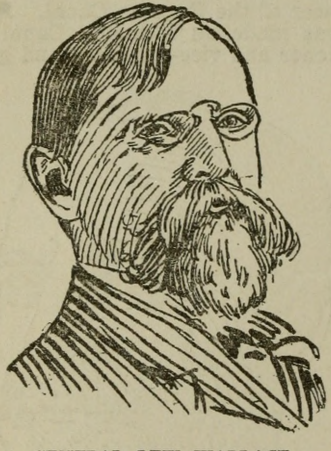


HUGH C. WALLACE

manager of the Panama Railroad and Steamship Company. From 1906 to 1917 he was president and chairman of the board of directors of Westinghouse,

Church, Kerr & Company. He also designed and constructed the terminals of the World's Fair at Chicago, the new passenger terminals for the Chicago and Northwestern Railroad at Chicago, and acted at various times as adviser and consultant to large corporations. He was president of the American Society of Civil Engineers and of the American Railway Engineering Association, as well as a member of the Institution of Civil Engineers of Great Britain.

WALLACE, LEWIS (better known as LEW), an American military officer and author; born in Brookville, Ind., April 10, 1827; was lieutenant in the Mexican War in 1846-1847; took a distinguished part in the Civil War in which he served in the campaigns in West Virginia and Kentucky; commanded a division at the capture of Fort Donelson; led the attack in the second day's fight in the battle of Shiloh; took part in the subsequent advance on Cor-



GENERAL LEW WALLACE

inth; saved Cincinnati, O., from capture by Gen. E. Kirby Smith; and was president of the court appointed to investigate the conduct of General Buell. In 1864 he commanded the Middle Department and the 8th Army Corps, and in the battle of Monocacy (July 9, 1864), prevented the capture of Washington and Baltimore by General Early. He was a member of the commission which tried the assassins of President Lincoln, and in the same year presided over the court which tried Captain Wirz, the commandant of the Andersonville prison. In 1866 he was sent to Mexico on a secret diplomatic mission to President Juarez; was appointed governor of New Mexico in 1878; and was United States Minister to Turkey in 1881-1885. When not engaged in public service he practiced law and devoted himself to literature. His publications include: "The Fair God"; "Ben Hur, a Tale of the Christ"; "The Prince of India." He died at Crawfordsville, Feb. 15, 1905.

WALLACE, SIR RICHARD, an English philanthropist; born in London, England, July 26, 1818; removed to Paris; and became heir to the large fortune of the Marquis of Hertford, including a very valuable collection of paintings and other objects of art, to which he made large additions and which his widow bequeathed in 1897 to the nation. It is valued at $25,000,000 and is permanently on exhibition in Hertford House (the original of Gaunt House in "Vanity Fair"). Sir Richard was well known for his extensive benefactions, especially during the period of the Paris Commune, and these services were recognized in 1871 by his elevation to a baronetcy and his appointment as a commander of the Legion of Honor. In 1873 he was elected to Parliament. He died in Paris, July 20, 1890.

WALLACE, SUSAN ARNOLD ELSTON, an American author; wife of General Lewis Wallace; born in Crawfordsville, Ind., Dec. 25, 1830; was married to General Wallace in 1852. Besides contributing to periodicals she wrote: "The Storied Sea" (1883); "Ginevra" (1886); "The Land of the Pueblos" (1888); "The Repose in Egypt" (1888); etc. She died in 1907.

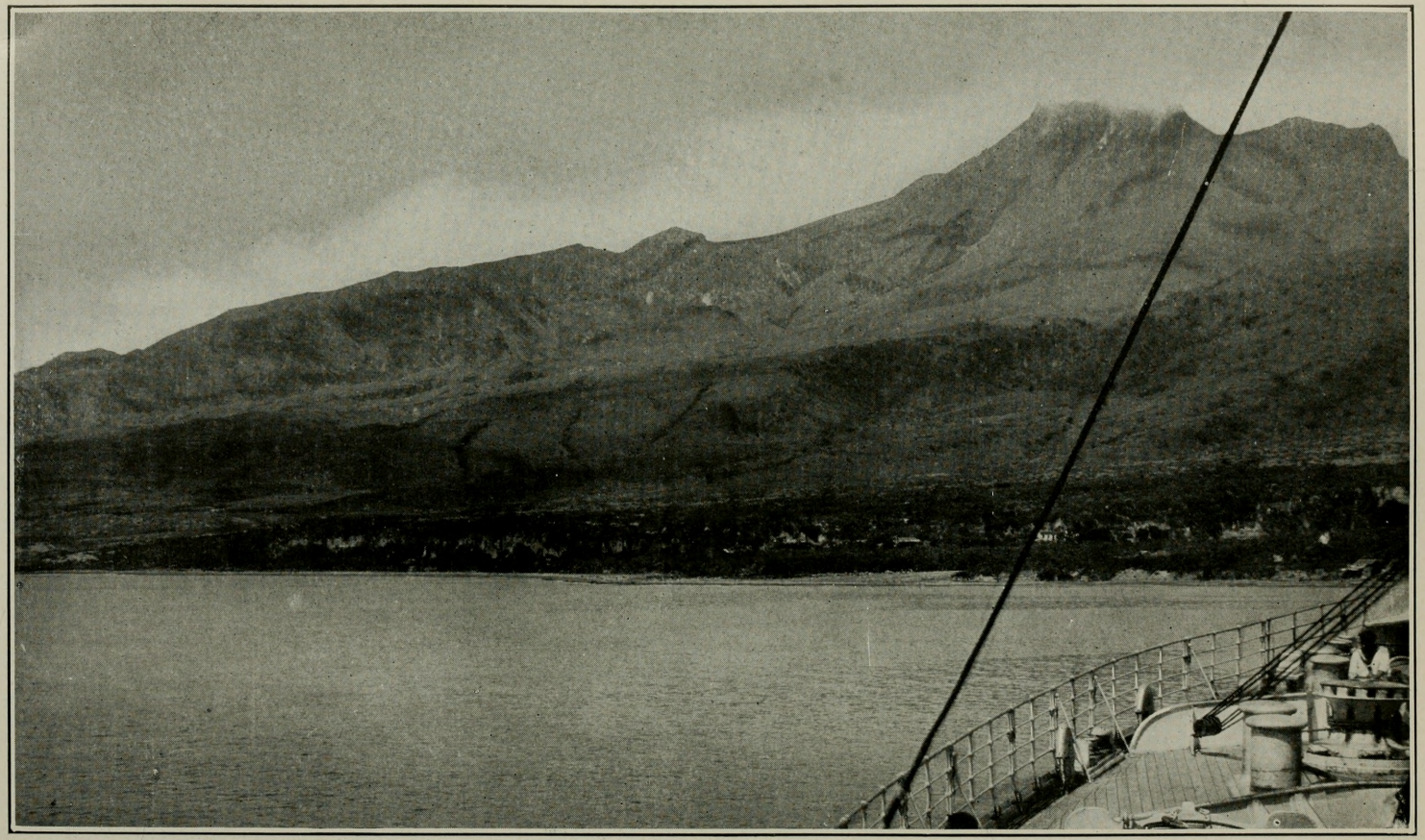
WALLACE, SIR WILLIAM, a Scotch patriot; born in Ayrshire, Scotland about 1270. Having slain the son, and several of the retainers of the English sheriff of Dundee, for an insult offered to him, Wallace fled to the woods, and was outlawed. Gathering together a number of followers he drove the English out of Aberdeen, Forfar, Brechin, and elsewhere, and in 1297 defeated the English army at the battle of Stirling bridge—thus liberating his country for a time. He was chosen one of the commanders-in-chief of the Scotch army, and afterward guardian of the kingdom, during the captivity of Baliol. He penetrated into England, and ravaged Durham with fire and sword. Edward I., then in Flanders, immediately hastened home, and marched against Wallace, who was defeated. He carried on a guerrilla warfare against the English during several years, was betrayed, and executed in London, Aug. 24, 1305.

WALLACE, WILLIAM VINCENT, a British musical composer; born of Scotch parents, in Waterford, Ireland, June 1, 1814. From his father, a band-



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AN ERUPTION OF STROMBOLI VOLCANO



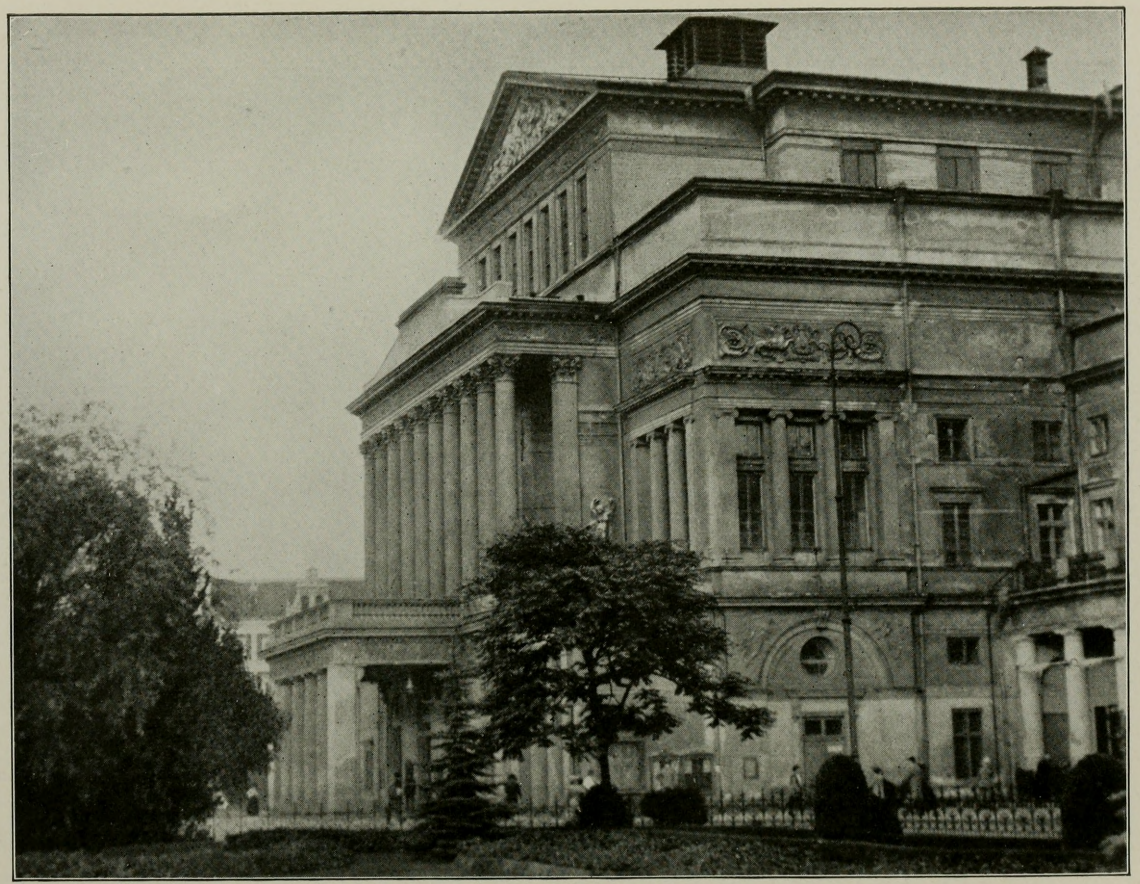
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MT. PELEE, THE VOLCANO IN MARTINIQUE WHICH DESTROYED THE CITY OF ST. PIERRE



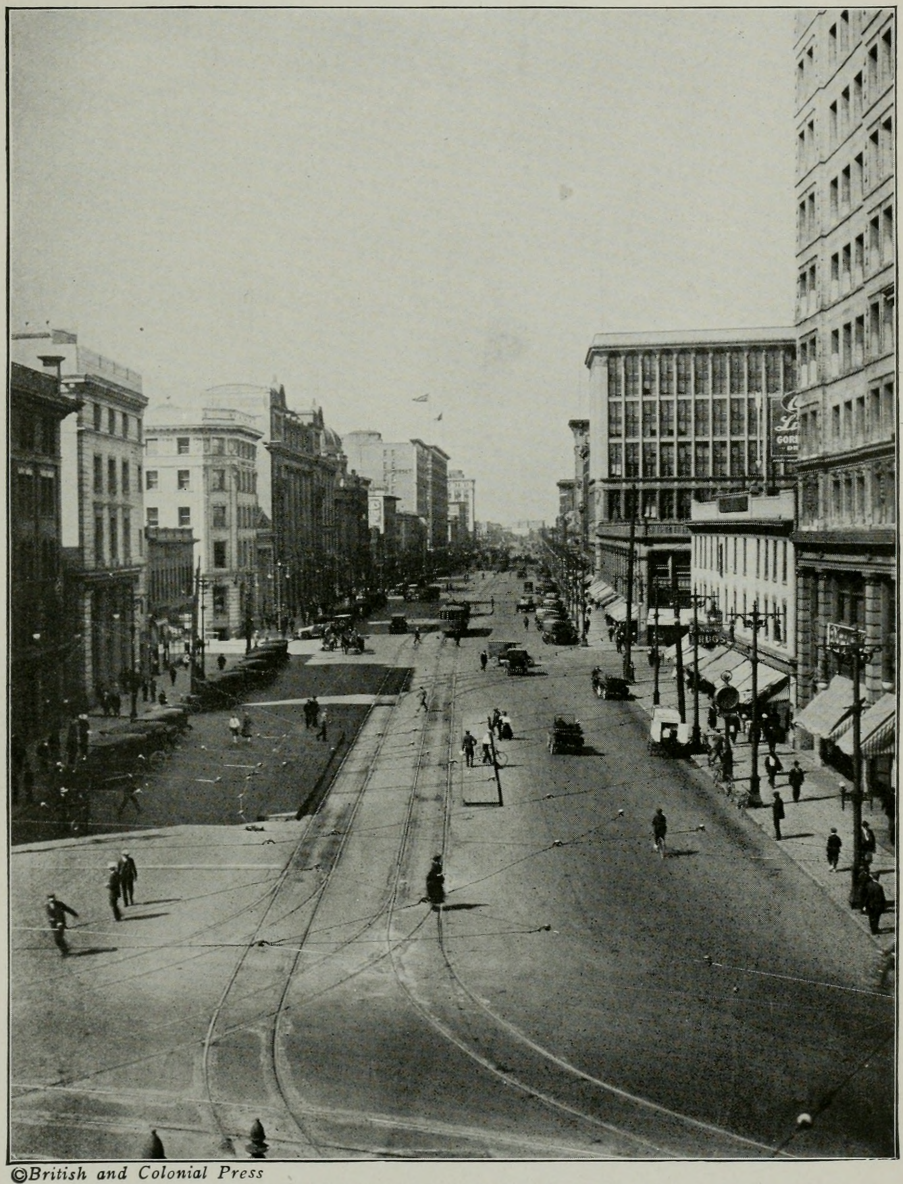
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A LAVA FLOW AND ACTIVE CRATERS ON THE VOLCANO OF KILAUEA, ISLAND OF HAWAII



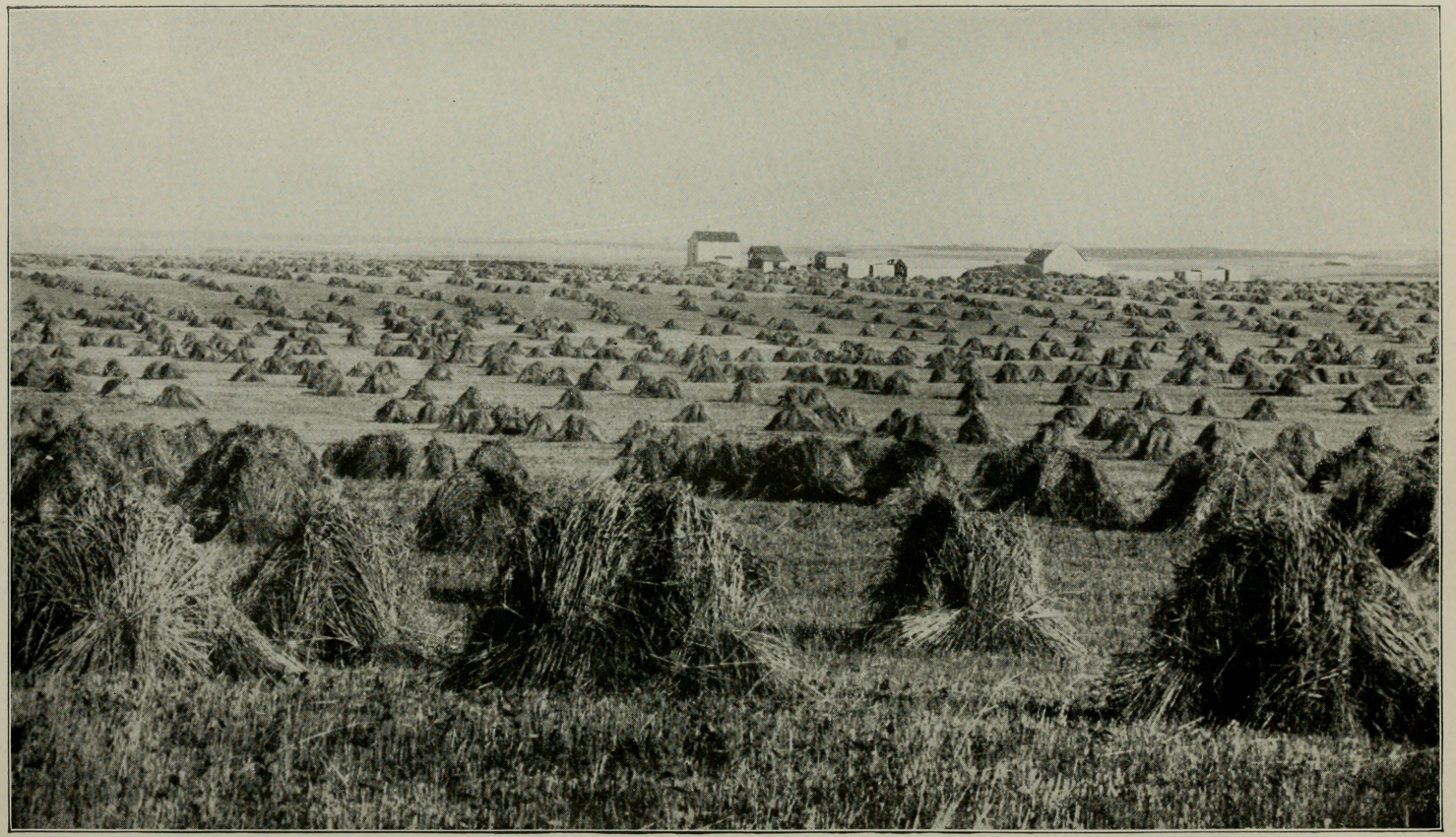
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THE GRAND OPERA HOUSE IN WARSAW, CAPITAL OF POLAND

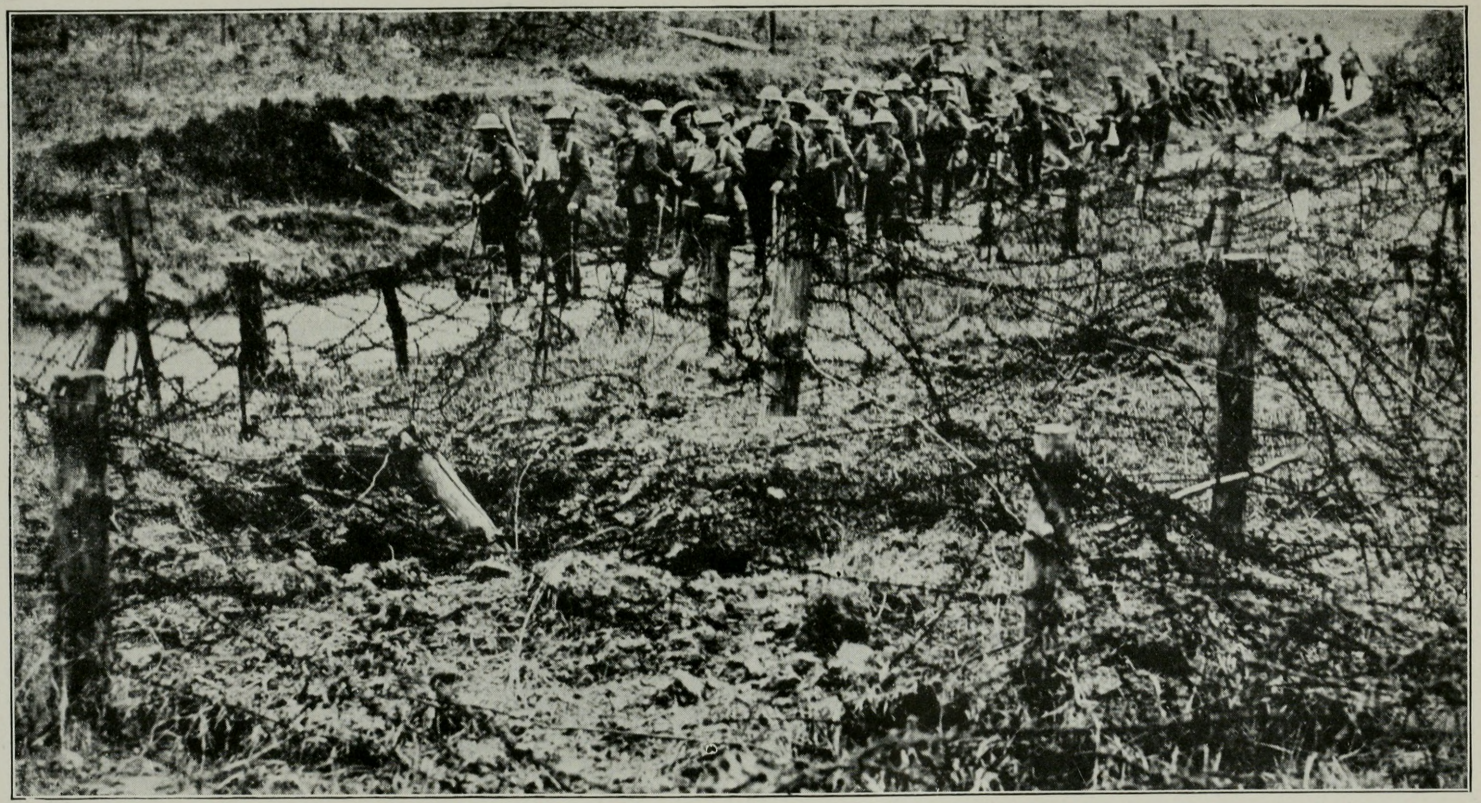


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PORTAGE AVENUE, WINNIPEG, MANITOBA



WHEAT FIELDS OF SASKATCHEWAN



SOLDIERS WITH WIRE CUTTERS ADVANCING INTO THE BARBED-WIRE ENTAGLEMENTS IN FRONT OF THE HINDENBURG LINE



GERMAN PRISONERS BRINGING IN AMERICAN WOUNDED

master, he learned to play on military instruments, and also studied the violin, pianoforte, and guitar. He spent some years in Australia, and made an extensive concert tour in the Australian colonies, India, and the United States. In 1845 he went to London, and devoted himself to composition. His first opera, "Maritana," was produced at Drury Lane, 1845, and secured him at once a reputation. "Lurline" and the "Amber Witch" are his other chief operatic compositions. He wrote numerous airs for the pianoforte. He died in Haute Garonne, France, Oct. 12, 1865.

WALLACHIA, one of the two principalities of southern Europe that were united in 1861 to form the kingdom of Rumania. It is bounded on the N. by Moldavia and Transylvania, on the N. W. by Hungary, on the W. and S. by the Danube river, separating it from Serbia and Bulgaria, and on the E. by the Danube, separating it from Dobrudja; area about 30,000 square miles; capital, Bucharest. Pop. about 4,800,000. See RUMANIA.

WALLACK, JAMES WILLIAM, an American actor; born in London, England, Aug. 24, 1795; began his professional career as Laërtes to Elliston's "Hamlet" in 1813; and in 1816 appeared as Iago to Edmund Kean's "Othello." He came to the United States in 1818, and on Sept. 7 made his first appearance in New York City in the Park Theater as "Macbeth." He became stage manager of the Drury Lane Theater in 1820; opened the National Theater in New York City and managed it till it was destroyed by fire in 1839; opened Wallack's Lyceum in 1852 and in 1861 built Wallack's Theater in New York City. He died in New York City, Dec. 25, 1864.

WALLACK, LESTER JOHN, an American actor and manager, son of James William Wallack; born in New York, Jan. 1, 1820. He conducted Wallack's Theater, New York City, for 24 years; was identified with the American stage for more than 40 years; and on his retirement in May, 1888, was the recipient of an unequaled dramatic testimonial. He wrote the plays "The Veteran" and "Rosedale." His autobiography, "Memoirs of Fifty Years," was published the year after his death. He died in Stamford, Conn., Sept. 6, 1888.

WALLA WALLA, a city and county-seat of Walla Walla co., Wash.; on the Walla Walla river, and on the Navigation Company's, the Oregon-Washington and the Northern Pacific railroads; 160 miles E. of The Dalles, Ore. It is the trade center of east central Washington and contiguous parts of Idaho and Oregon. Here are Whitman College (Cong.), St. Vincent's Academy, De La Salle Institute, Fort Walla Walla, a United States military post, United States and State penitentiaries, National and other banks, and several daily and weekly newspapers. The industries include foundries and machine shops, and flour and lumber mills. Pop. (1910) 19,364; (1920) 15,503.

WALL CREEPER, the *Tichodroma muraria*, a native of southern and central Europe. It frequents walls and perpendicular rocks in preference to trees, the favorite resort of the genus *Certhia*. It is a very pretty bird, about six inches long; plumage light gray, with bright crimson on the shoulders, the larger wing coverts, and the inner webs of the secondaries; the rest of the wings black; tail black, tipped with white. Called also spider catcher, from its habit of feeding on spiders and insects.

WALLENSTEIN, ALBRECHT WENZEL EUSEBIUS, COUNT VON (val' len-stine), the great general of the Imperialists, in the Thirty Years' War; born in 1583, of an ancient and wealthy family of Bohemia. In his youth he repaired to Italy, where he studied philosophy, astronomy, and the sciences then in vogue, and would have become an adept in the abstruse doctrines then so generally believed in, had not the condition of his country called him from the study of the occult sciences to the practice of war. As a soldier and leader he gained honor and distinction on his first field by defeating the Turks, who had penetrated into Hungary. From this time he devoted himself to the service of his country, and in a few years rose to be regarded as the most popular and consummate general in Europe; his vast wealth, immense estates, and extraordinary popularity giving him a power and influence hardly less than sovereign. He became in a few years the mainstay and support of the Imperial cause, and, both alone and in conjunction with Tilly, obtained several victories, and more than once raised the empire from the verge of ruin by his counsel and skill as a commander. For these services he received the dukedom of Mecklenburg, and immense tracts of land both in Bohemia and Hungary. His power and his influence, however, procured for him many enemies, to whom his sovereign, forgetful of the services he had rendered, lent so willing an ear that Wallenstein, indignant at the coldness of the emperor, threw up his commission and retired to the privacy of his paternal estates.

Hardly had Wallenstein quitted the

court of his ungrateful master when the "Lion of the North," as he was called—Gustavus Adolphus of Sweden—invaded the empire with his Protestant army, and carried such defeat and ruin into the heart of the Imperial dominions, that the Emperor Ferdinand, seeing his generals slain, his armies routed, and the haughty foe advancing on his capital, was compelled to implore Wallenstein—the man he had so deeply injured—to return, and not only save the empire from ruin, but his sovereign from humiliation. Having obtained his own terms from the weak and ungrateful Ferdinand, Wallenstein raised his banner, and so much was he beloved by the soldiery that in less than seven days he had armed and equipped 50,000 men at his own cost, and advancing against the successful enemy, drove Gustavus out of Bavaria, and following him into Saxony, forced him at Lützen to hazard a pitched battle, in which, though the Imperialists were defeated, the death of Gustavus, who fell in the moment of victory, was considered an ample equivalent. The death of the Swedish king made the rest of the war easy, and by Wallenstein's vigilance the empire was again saved. Ferdinand, once more firmly seated on his throne, again became envious of the man to whom he owed both life and crown, and, taking offense at the devotion of Wallenstein's officers, accused



EDMUND WALLER

their chief of treason, and issued an order to take him dead or alive. On this Wallenstein fled with a party of friends to the castle of Eger, where its commander treacherously murdered him and all his devoted friends, in 1634.

WALLER, EDMUND, an English poet; born in Coleshill, Hertfordshire, England, March 3, 1606. He was educated at Eton and King's College, Cambridge. His mother was a sister of John Hampden, and a royalist, but all the rest of his relatives were against the court. His first collection of poems appeared in 1645. He was noted for his wit and was a great favorite at court, in Parliament, and in society, and sang the praises of the Lord Protector as well as those of the Stuarts. He was a member of the "Long Parliament" and was sent as commissioner to the king, after the battle of Edgehill. Shortly after, he plotted in favor of the king, and when detected, turned informer, but by judicious bribery got off with banishment and a fine of $50,000. After nearly ten years of exile in Paris, Cromwell allowed Waller to return in 1653, and he took his usual place in society and Parliament, and was afterward welcome at the courts of Charles II. and James II. He died in Beaconsfield, England, Oct. 21, 1687.

WALLFLOWER, the common name of the species of plants belonging to the genus *Cheiranthus*, natural order *Cruciferæ*. They are biennial or perennial herbs or undershrubs. Many of them exhale a delicious odor, and are great favorites in gardens. The best known is the *C. Cheiri*, or common wallflower, which, in its wild state, grows on old walls and stony places. In the cultivated plants the flowers are of more varied and brilliant colors, and attain a much larger size than in the wild plant, the flowers of which are always yellow.

WALLINGFORD, a borough of Connecticut, in the town of the same name, in New Haven co. It is on the Quinnipiac river, and on the New York, New Haven and Hartford railroad. Its industries include the manufacture of silver goods, plated goods, wire, brassware, hardware, iron and brass bedsteads, etc. It has a sanitarium, a public library, a Masonic Home, and other public buildings. Pop. (1910) 8,690; (1920) 9,648.

WALLIS, JOHN, an English mathematician; born in Ashford, England, Nov. 23, 1616. Educated for the Church at Emanuel College, Cambridge, he took orders in 1640, and in 1663 obtained a living in London. He was one of the secretaries to the Assembly of Divines at Westminster; became Savilian Professor of Geometry at Oxford in 1649. Charles II., for services rendered to the royal cause, made him one of the royal chaplains, and in 1661 he was one of the revisers of the "Book of Common Prayer." He was one of the earliest and most useful members of the Royal Society, founded in 1663. He was the

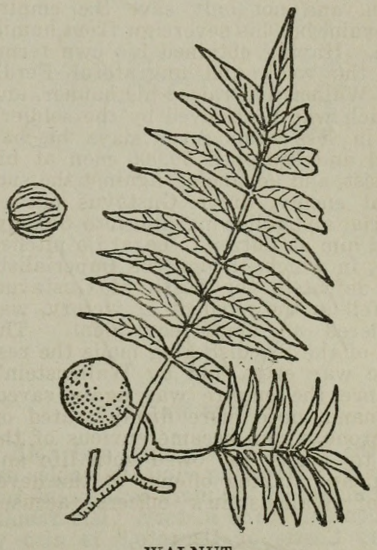
author of many mathematical, theological, and controversial works and papers, the most important of which are his "Arithmetic of the Infinities," and his "Mechanics." He died in Oxford, Oct. 28, 1703.

WALLOONS, or **WALLONS**, lineal descendants of the old Gallic Belgæ, who occupy the Belgian provinces of Hainault, Liège, Namur, and part of South Brabant and west Luxembourg. They are superior in physique to their Flemish compatriots, and a large proportion of them have black hair and eyes. Their language, also called Walloon, is a French patois retaining numerous Gallic words, but it somewhat varies in the different provinces. The first permanent colony of New Amsterdam (New York) contained many Walloons, their present descendants being distinguished from those of Dutch lineage by their French names.

WALL PAPER, for ordinary purposes consists of a tough, but not a thick paper, printed with a pattern in size colors. For expensive wall papers a rather stout paper is used, and for very cheap kinds a paper of such poor quality that it can only be pasted on walls without tearing by great care. According to the United States census of manufactures (1914) there were in the United States 48 establishments, with a capital of $17,620,000, employing 5,689 persons and producing goods valued at $15,887,000.

WALL STREET, a short street in New York City, extending from Broadway, opposite Trinity Church to the East river. It is called the financial center of America, for it is here that the prices of stocks and securities are made, and that men become millionaires or paupers in a day. The New York Stock Exchange, which is the dominant feature of this locality, is the most powerful financial institution in the United States.

WALNUT, a genus comprising seven or eight species of beautiful trees of the natural order *Juglandaceæ*. All are trees with alternate pinnated leaves, monœcious flowers, and a drupe-like fruit, with a deciduous fleshy husk, which bursts irregularly, and a deeply wrinkled shell (*putamen*) of two valves, within which is the seed, curiously lobed and wrinkled, with a membranaceous testa and partial dissepiments. The common walnut (*J. regia*) is a native of Persia and the Himalayas, but has long been cultivated in all parts of the S. of Europe. The date of its introduction is unknown, but it was certainly cultivated by the Romans in the reign of Tiberius. It is a lofty tree of 60 to 90 feet, with large spreading branches. The leaves have two to four pairs of leaflets, and a terminal one. They have a fine balsamic odor when bruised; this quality, however, being much more marked in some trees than in others. An infusion of them has been found useful in scrofula; when bruised and rubbed on the skin they are efficacious in curing itch; and placed in wardrobes they prevent the ravages of moths. The sap is limpid like

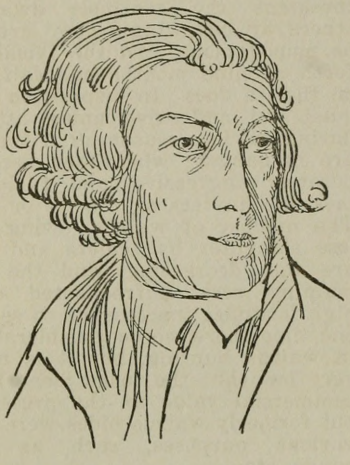


WALNUT

water, but contains much sugar, so that the tree is sometimes tapped for it, like the sugar maple, and the sugar is procured by evaporation; a pleasant kind of wine is also made from it.

WALPOLE, HORACE, EARL OF OXFORD, an English author, 3d son of Sir Robert Walpole; born in London, Sept. 24, 1717; was educated at Eton, and King's College, Cambridge, on leaving which he traveled two years on the Continent in company with Gray the poet. Returning in 1741 he entered the House of Commons and sat for various constituencies up to 1768. He always took a lively but superficial interest in politics, inclining sentimentally to extreme opinions. In 1747 he purchased "Strawberry Hill," near London, where he erected a Gothic villa, laid out the grounds with minute ingenuity, and made it a principal business of his life to adorn and furnish it with objects of curiosity and antiquarian interest. His maintenance was provided for by some sinecure appointments. In 1757 he established a private printing press at "Strawberry Hill," at which he printed not only his own works but those of others. In 1791

he succeeded his nephew in the peerage. He never took his seat in the House of Lords, and appears to have avoided using his title. The works of Horace Walpole are numerous; but his fame as a writer rests on his "Letters" and "Memoirs." The former are held to be unsurpassed



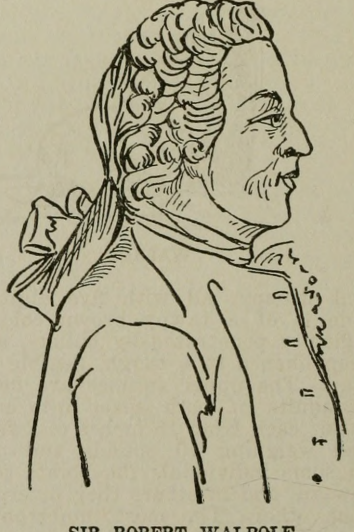
HORACE WALPOLE

in the English language, and both are highly interesting and valuable as a storehouse of the more evanescent traits of contemporary history. His romance, "The Castle of Otranto," is also well known. He died in London, March 2, 1797.

WALPOLE, HUGH SEYMOUR, a British author, born in 1884, son of the Bishop of Edinburgh. He finished his education at Cambridge University, and almost immediately took up literature as his life vocation, publishing his first novel, "The Wooden Horse," at the age of twenty-five. After the outbreak of the World War he went to Russia as a member of the Red Cross, where he incidentally gathered the material for the novel which gained him his first wide popularity among intellectual readers, "The Secret City" (1919), the city indicated in the title being Petrograd. He has also written, "Maradick at Forty" (1910); "The Prelude to the Adventure" (1912); "The Dark Forest" (1916); and "Jeremy" (1919).

WALPOLE, SIR ROBERT, EARL OF OXFORD, an English statesman; younger son Sir Robert Walpole; born in Houghton, England, Aug. 26, 1676; was educated at Eton, and at King's College, Cambridge; succeeded to the paternal estate in 1700, and entered Parliament as member for Castle Rising. In 1702 he was elected for King's Lynn, became an active member of the Whig party, and soon distinguished himself by his business capacity, and by his debates. In 1712 he was expelled from Parliament for breach of trust and corruption, and sent to the Tower, but was returned to his seat the following year. He was Secretary of War and leader in the House of Commons in 1708, paymaster of the forces in 1714 and 1720, and first lord of the treasury and chancellor of the exchequer in 1715, and again in 1721, and prime minister from 1715-1717 and from 1721-1742. During his long administration the Hanoverian succession, to which he was zealously attached, became firmly established, a result to which his prudence and political sagacity largely contributed. He relieved the weight of taxation by many improvements in the tariff. In 1724 he was made a Knight of the Bath, in 1726 a Knight of the Garter, and in 1742 was created Earl of Orford. An able monograph on Walpole has been published by John Morley. He died in Houghton, England, March 18, 1745.

WALPURGA, WALBURGA, or **WALPURGIS**, a female saint; born in England early in the 8th century, died 779. She was for many years a nun in a Dorsetshire convent. As a niece of St. Boniface, and sister of St. Willibald, first bishop of Eichstädt, Bavaria (741-786), she was induced to proceed to Germany to found convents, and in 754 she

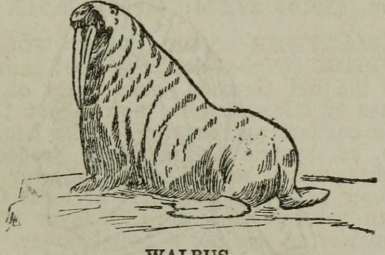


SIR ROBERT WALPOLE

became abbess of Heidenheim, a convent within her brother's bishopric. She died at the latter place, but was buried at Eichstädt, and her shrine was visited by many pilgrims and was the scene of

many miracles. Though her feast properly falls on Feb. 25, the eve of May 1, associated with some of the most popular of the witch superstitions of Germany, is called Walpurgis' Night. On that night witches were believed to ride through the air on broomsticks, etc., to some witch hill where they held a rendezvous with the devil. Such meetings were called the "Witches Sabbaths." The most famous witch hill was the highest part of the Hartz Mountains, called the Brocken or Brocksberg. The Beltane or Beltain festival was observed in Scotland and Ireland on the same date.

WALRUS, in zoölogy, the *Trichechus rosmarus*, called also the morse, seahorse, and sea cow. The walrus is now confined to the regions within the Arctic Circle, though its extinct ancestors had a much wider geographical range. It is a large carnivorous marine mammal, ordinarily from 10 to 12 feet long, with a girth of nearly as much; it is said that it sometimes attains a length of 20 feet; muzzle abruptly truncated, with long and remarkably strong bristly moustaches; small eyes; external ear wanting, though the orifice is distinctly visible; body large and sack-like, tapering toward the tail; hind limbs short, connected by a membrane which covers the tail, fore limbs strong



WALRUS

and stumpy, all with five digits. The hide is of a tawny brown color, with difficulty penetrated by bullets, and has been likened to a tough, flexible coat of mail. The upper canines are developed in adults of both sexes into immense tusks, each from 15 inches to 2 feet long and weighing 10 pounds and upward. In some individuals the points converge toward, and in others they diverge from each other. The most important function of these tusks is digging shell fish, the favorite food of the walrus, out of the banks and mud of shoal water. They also raise the body out of the water, by digging into ice floes, which probably gave rise to the legend of the rosmarine; and they form terrible weapons of offense, as by a quick turn of the neck the animal can strike upward, downward, or sideways with equal dexterity. Walruses are gregarious, and are found on the seashore and on ice floes; some keep guard while those of the main body sleep, and when danger threatens the sentinels awaken the others by bellowing. They are said to be monogamous, and the female brings forth at nine months one calf, usually on the ice floes. In disposition they are quiet and inoffensive, unless attacked or during the love season, or if their young are in danger; when they become desperately aggressive, and furiously attack the hunters on the ice or in boats. The number of walrus, owing to reckless slaughter by sealers and whalers, are fast decreasing, and the few remaining seek unfrequented spots in high latitudes inaccessible to sealers. At one time there was a considerable trade in walrus hunting, but it is now at a very low ebb; the tusks alone have any commercial value at the present time; but formerly walrus hides were used for various purposes, such as machine bands, etc.

WALSALL, a town of Staffordshire, England; 8 miles N. N. W. of Birmingham. It is situated on a small affluent of the Tame and has numerous public buildings. The special manufactures are saddlers' ironmongery and all kinds of leather goods (saddles, harness etc.), the latter being largely exported. Walsall lies on the margin of the southern Staffordshire mineral field, and produces a great variety of hardware, small castings, gas tubes, chandeliers, iron bedsteads, silver and brass plating, etc. Coal and lime are wrought in the vicinity. Pop. about 95,000.

WALSH, DAVID IGNATIUS, an American lawyer and United States Senator, born at Leominster, Mass., in 1872. He was educated at Holy Cross College and at the Boston University Law School, and received honorary degrees from various Catholic colleges and universities. In 1897 he was admitted to the bar; from 1898 to 1900 he was moderator of the town meetings in Clinton, Mass.; from 1900 to 1901 a member of the Massachusetts House of Representatives; in 1913 lieutenant-governor and in 1914-1915 governor of Massachusetts. In 1917 he was a member at large of the Massachusetts Constitutional Convention, and in 1918 he was elected as a Democrat to the United States Senate for the term 1919 to 1925.

WALSH, ROBERT, an American author; born in Baltimore, Md., in 1784.

In 1837 he removed to Paris, where he was consul in 1845-1851. He wrote for "Dennie's Portfolio," and edited the "American Review of History and Politics," the first American quarterly (22 vols. 1827-1837); most of the articles were from his pen. Others of his publications are: "Correspondence Respecting Russia Between R. G. Harper and Robert Walsh, Jr." (1813); "An Essay on the Future State of Europe" (1813); biographical prefaces to an edition of the English poets in 50 small volumes; "An Appeal from the Judgments of Great Britain Respecting the United States of America" (1819). He conducted the "American Register" (1817-1818), the "National Gazette" (1821-1837), and the "Museum of Foreign Literature and Science" (vol. i. 1822); and edited "Didactics: Social, Literary, and Political," a collection of aphorisms (2 vols. 1836). He died in Paris, Feb. 7, 1859.

WALSINGHAM, SIR FRANCIS, an English statesman; born in Chiselhurst, England, about 1530. After studying at King's College, Cambridge, he traveled on the Continent for some time, and acquired a good knowledge of foreign languages and politics. He was introduced by Cecil, Lord Burleigh, to public service, under Queen Elizabeth, and employed in embassies to France, the Netherlands, and Scotland. He also sat in the House of Commons for various constituencies, was knighted, made a member of the Privy Council, and one of the principal secretaries of state. The unraveling of the Babington plot against Queen Elizabeth was intrusted to Walsingham, and he was also one of the commissioners who tried Queen Mary. He died in Born Elms, near London, April 6, 1590.

WALTER, THOMAS USTICK, an American architect; born in Philadelphia, Pa., Sept. 4, 1804; began the study of architecture in the office of William Strickland, with whom he remained till 1830, when he engaged in independent practice. His first important work was the Moyamensing penitentiary, built in 1831. In 1833 he made the designs for the Girard College building, which on its completion in 1847 was pronounced the finest specimen of classic architecture in the United States. His next great work was the breakwater at La Guayra for the Venezuelan Government. In 1851 his design for the extension of the National Capitol at Washington, D. C., was adopted. Having been appointed government architect, he removed to Washington, and remained there till the completion of the work in 1865. While in Washington he also designed the extensions of the patent office, treasury, and postoffice buildings, the dome of the Capitol, and the Government Hospital for the Insane. He was a member of the American Philosophical Society, and an original member of the American Institute of Architects; and was also Professor of architecture in Franklin Institute and lecturer on architecture in Columia College. He died in Philadelphia, Pa., Oct. 30, 1887.

WALTHAM, a city in Middlesex co., Mass.; on both sides of the Charles river, and on the Boston and Maine railroad; 10 miles W. of Boston. It contains a public library, the Leland Home for Aged Women, a hospital, Home for the Feeble-minded, waterworks, street railroad and electric light plants, National and savings banks, and several daily and weekly newspapers. The city is widely known for its manufacture of watches, for which there are several establishments, one of which is the largest watch factory in the world, in which watch making by machinery on an extensive scale was first attempted. Here also was built the first cotton mill in the United States where all the operations of cotton manufacture were conducted under one roof. The other industries include the manufacture of crayons, hosiery, brass goods, aeroplanes, bicycles, electric clocks, etc. Pop. (1910) 27,834; (1920) 30,915.

WALTHER VON DER VOGELWEIDE (fō'gl-vī-de), the most eminent of the old German lyric poets of the class of Minnesingers; born about 1170. His earliest patrons were Duke Leopold VI. of Austria and his son, Frederick. Subsequently he visited, for shorter and longer periods, the courts of most German princes, who were in favor of an imperial as against a papal policy. The Emperor Frederick II. provided him with a small estate near Würzburg, where he seems to have always retired when disgusted with traveling, the courts, and intrigues. He was a politician and reformer as well as a poet, and his verses breathe a liberalism far in advance of his times; while the subjects of his favorite love songs are noble women. He died in Würzburg, about 1230.

WALTON, BRIAN, an English Biblical scholar; born in Seymour, Yorkshire, England, in 1600. He was made chaplain to Charles II. and Bishop of Chester at the Restoration. His greatest work is "Biblia Sacra Polyglotta" (6 vols., folio 1657), including the Hebrew original of the Old Testament,

the Samaritan Pentateuch, the Chaldee, Syriac, Arabic, Persian, and Latin Vulgate, with various readings, notes, etc.; still thought to be "the most complete Biblical apparatus in any language." He wrote in 1658 his "Dissertation on the Antiquity and Authority of His Texts," in later editions called the "Prolegomena," under which name it was published in the original Latin (2 vols. 1827-1828). "The Considerator Considered," etc. (1659), was written in answer to Dr. John Owen's "Vindication of the Purity and Integrity of the Hebrew and Greek Texts," etc., which was a criticism on his great Biblical work. He died in London, Nov. 29, 1661.

WALTON, GEORGE, an American patriot; born in Frederick co., Va., in 1740; studied law and was admitted to the bar in 1774; began practice the same year in Augusta, Ga. On July 27, 1774, with three others he called a public meeting in Savannah to consider certain public grievances, and was made a member of the committee to urge the various parishes to join the other provinces in resisting the arbitrary claims of Great Britain; was also on the committee which drew up a petition to the king. In 1776 he was one of the signers of the Declaration of Independence, and was a delegate to the Continental Congress from that year till October, 1781; was elected governor of Georgia in 1779 and 1789; was chief-justice of the State in 1783, 1787, and 1793; and United States Senator in 1795-1796. He died in Augusta, Ga., Feb. 2, 1804.

WALTON, IZAAK, an English author, known as the father of angling; born in Stafford, England, Aug. 9, 1593. About 1623 he was carrying on business on his own account as a sempster or man milliner in London, and having by 1643 acquired a competency, he retired to the quiet enjoyment of country life. His first wife, Rachel Floud, great grandniece of Archbishop Cranmer, having died in 1640, he married about seven years later Ann Ken, whose brother, at that time a mere boy, afterward became the famous bishop. In London Walton had became intimate with Dr. Donne, Dr. Wharton, and Sir Henry Wotton, and in his later years he enjoyed the hospitality of many eminent clergymen of the Church of England. Walton's fame is mainly based on his "Compleat Angler; or the Contemplative Man's Companion," which was first published in 1653 and appeared in a considerably modified form in 1655. Few more popular books exist, and the editions are consequently numerous. Walton's natural history is frequently of the crudest and most credulous kind; his practical precepts are open to correction at the hands of the modern proficient; he possesses only a partial mastery over the difficult literary form (that of the dialogue) in which his work is cast; his style is remarkable neither for rugged strength nor polished precision; but he succeeded in catching the spirit both of the gentle craft and the pleasant English scenery in which he had learned its delights. On the publication of Dr. Donne's "Sermons" Walton supplied a "Life" of the author, and he afterward wrote similar lives of Wotton, Hooker (1665), Herbert (1670), and Sanderson (1678). A monument to Walton was placed in St. Mary's Church, Stafford (the church of his baptism), in 1878. He died in Winchester, England, Dec. 15, 1683.

WALTZ, a dance said to have originated in Bohemia, now of almost universal adoption. It is performed by couples, who, almost embracing each other, swing round the room with a whirling motion. Also, the music composed for such a dance. The time is of triple measure in crotchets (quarter notes) or quavers (eight notes), and consists of 8 or 16 bar phrases. Modern waltz-writers frequently add to their original dance-form an introduction and coda. The "Vienna" waltz is characterized by a rapid movement and strict unbroken time. Ländler are slower and more dignified than the waltz. "Classical waltzes" are compositions in waltz form intended for set pieces, not for dance tunes. In them greater scope is given to the composer and performer than is compatible with the rhythm of the dance.

WAMPUM, the American Indian name for beads made of shells, formerly used as money, or as a medium of commerce. They were also united to form a broad belt, which was worn as an ornament, and was called wampumpaque, or wampeaque. The manufacture of wampum is carried on among the Germans living in the hills of Bergen co., N. J. The interior of a wampum workshop resembles a limekiln. The floors are hidden from sight by great heaps of shells, and the rude benches and tools are covered entirely with white-flying dust as the shells are being ground and drilled, and suggests the application of innumerable coats of whitewash, which in fact it really is.

The wampum makers purchase a cartload of conch and clam shells for 25 cents, delivered at their doors, and when a shell of sufficient thickness is selected it is broken with hammer and

chisel into cubes of about two inches in length and one-third of an inch square. This piece of shell is then securely wedged into a vise made of two pieces of wood connected with a hinge in the center. The jaws of the vise are opened and the shells inserted. Then the vise is closed tightly and held by pressure against the grindstone. In this manner, in a short time, the edges of the shell are rounded, and then the drill is brought into use.

The workman sits at a three-legged table, the top of which is fashioned from the half of a log, the under side still retaining the original bark covering, and, affixing one end of the drill to play freely in a button on his jacket, he next takes up a whalebone bow, similar to the kind used by jewelers, and, giving the cord a turn about the spool on the drill, he works the bow rapidly back and forth, from right to left, till the sharp end of the drill penetrates through the cube of shell from end to end lengthwise. When a sufficient number of cubes are completed they are then smoothed and polished with emery paper and strung on wires, precisely the same as children string beads, and they are then ready for the market. The wampum that is made from the streaked, bluish parts of hard clam shells is the most beautiful and therefore more valuable, and is harder and tougher to work. The price paid for the products of this almost obsolete industry is 14 cents a running inch on the string, and the average amount of money made by these shell artisans is about $6 a day during the season.

WANAMAKER, JOHN, an American merchant; born in Philadelphia, Pa., July 11, 1838; began his career as an errand boy in a bookstore; was afterward employed as a retail clothing salesman; and in 1861 established, with Nathan Brown, the clothing house of Wanamaker & Brown, in Philadelphia. In 1876 he founded a large department store in that city and subsequently converted the A. T. Stewart building on Broadway, New York, into a similar store. In 1889-1893 he was Postmaster-General. He was long active in religious work, and early founded the Bethany Presbyterian Sunday-school, in Philadelphia, which soon became one of the largest in the United States.

WANDEROO, or **WANDERU**, in zoölogy, the *Macacus silenus*, from the S. of Hindustan, especially the country bordering the Malabar coast. It is about 2 feet in length, tail 10 to 12 inches. The wanderoos have long, slim bodies, covered with black hair, tail of the same color, tufted. The head looks very large, because of a mane, or ruff, and beard which sticks out round the face. This mass of long hair is either gray or white, and adds to the sly look of the broad face, soft dull eyes, and broad muzzle. Also, any species of the genus *Semnopithecus*. *S. ursinus* is the great wanderoo.

WAPENTAKE, or **WAPENTAC**, a name formerly given in some of the N. shires of England, and still retained in Yorkshire, to a territorial division of the county corresponding to the hundred of the S. counties. The word means "weapon-touching" and refers to the custom of the chiefs of a particular district meeting at a certain day at a specified spot, when the head chief alighting from his horse, raised his spear in the air, and the inferior chiefs, also on foot, touched this spear with their lances, and so acknowledged their fealty.

WAPITI, the name given by the North American Indians to *Cervus canadensis*, a native of North America, ranging from the Carolinas to lat. 56-57° N. It is closely allied to but considerably

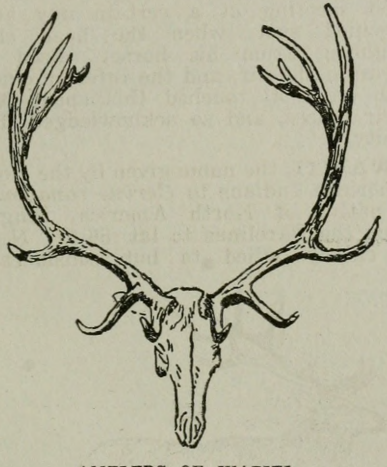


WAPITI

larger than the stag, standing about 54 inches at the shoulder; yellowish brown on the upper parts; sides gray, long coarse hair in front of neck, like a dewlap; antlers large, brow-tine duplicated. It frequents low grounds, or woody tracts near savannahs or marshes. The venison is of little value, as it is coarse and dry; but the hide makes excellent leather. It is called also, but erroneously, the elk and gray moose.

WAR, a contest between nations and States (international war), or between parties in the same state (civil war), carried on by force of arms, and resorted to either for purposes of advan-

tage or of revenge. Formerly, war was waged at the will of despotic monarchs; now wars usually arise, in the first instance, from disputes concerning territorial possessions and frontiers, unjust dealings with the citizens of one state by another, questions of race and sentiment, jealousy of military prestige, or mere lust of conquest. Civil wars arise from the claims of rival competitors for the supreme power in a state, or for the establishment of some important point connected with civil or religious liberty. In all cases, the object of each contending party is to destroy the power of the other by defeating or dispersing



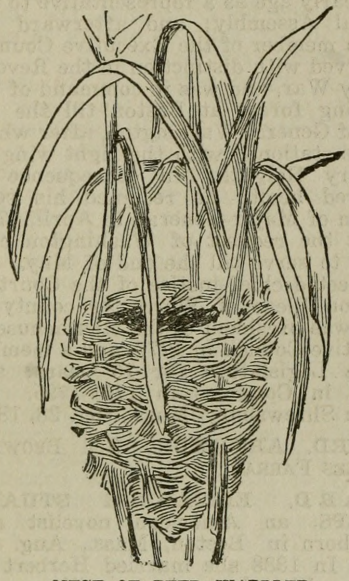
ANTLERS OF WAPITI

his army or navy, by the occupation of some important part of his country, such as the capital, or the principal administrative and commercial centers, or the ruin of his commerce, thus cutting off his sources of recuperation in men, money, and material. An international or public war can only be authorized by the sovereign power of the nations, and previous to the commencement of hostilities it is now usual for the state taking the initiative to issue a declaration of war, which usually takes the form of an explanatory manifesto addressed to the neutral states. An aggressive or offensive war is one carried into the territory of a hitherto friendly power; and a defensive war is one carried on to resist such aggression. Certain laws, usages, or rights of war are recognized by international law. By such laws it is allowable to seize and destroy the persons or property of armed enemies, to stop up all their channels of traffic or supply, and to appropriate everything in an enemy's country necessary for the support or subsistence of the invading army. On the other hand, though an enemy may lawfully be starved into a surrender, wounding, except in battle, mutilation, and all cruel and wanton devastation, are contrary to the usages of war, as are also the bombarding of a defenseless town, firing on a hospital, the use of poison in any way, or torture to extort information from an enemy.

WAR, PRISONERS OF, in general persons captured from the enemy during military or naval operations. In former times the entire people of a vanquished city, state, or nation became the absolute property of the victors; the men were either put to death or with the women and children became slaves. By later usage the combatants or fighting force are the ones commonly considered and treated as prisoners of war. The young, the sick, the aged; Sisters of Charity, physicians, nurses, and others regularly engaged in attending the sick and wounded; clergymen, representatives of the Red Cross and other recognized humane organizations; musicians with an army; and a variety of other people are considered noncombatants, and are exempted from the treatment accorded to captured combatants. The status of prisoners of war, as far as laws, rules, and customs go, is exceedingly complicated. Where it is desired to weaken an enemy by depriving it of its fighting material, a nation may hold its prisoners of war till after peace is declared. In such a case it will place them in more or less large bodies in or near cities where they can be kept under surveillance. During the time they are held they are entitled to food, medical attendance, and necessary clothing. As long as they do not disturb the quiet of the place or plot mutiny or resistance to their guard, they must be treated without violence or harshness.

WARBECK, or OSBEC, PERKIN, a pretender to the English crown; was the son of a Flemish Jew, and was set up by Margaret of York, Dowager-Duchess of Burgundy, as claimant of the crown of England against Henry VII. For this purpose she recognized him as her nephew, Richard Plantagenet, Duke of York, the younger of the two princes who were murdered in the Tower by Richard III. He was patronized by France and Scotland, married a kinswoman of the Scotch king, James IV., made several fruitless invasions of England and Ireland, was taken prisoner after an attempt on Cornwall (October, 1497), and confined to the Tower, where, his plotting being continued, he was executed, Nov. 23, 1499.

WARBLER, a popular name often applied to all the birds of the family *Sylviidæ;* (sometimes called by the French name of fauvettes); many of which, however, commonly receive other popular names as the blackcap, nightin-

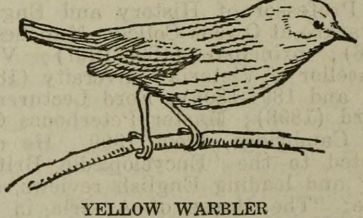


NEST OF REED WARBLER

gale, head sparrow, red breast, redstart, stonechat, wheatear, whitethroat, etc., while many receive the name warbler with some adjunct—reed warbler, etc. The more typical genera comprise birds of small size and plain plumage, usually alike in both sexes; most of them are migratory, going a long way S. of their breeding haunts to winter; for instance, the Siberian chiff chaff (*Phylloscopus tristis*) winters in India. Such genera are *Sylvia*, to which the blackcap and garden warbler belong; *Locustella*, of which is the grasshopper warbler (*L. nævia*), not infrequent in many parts of England, and found also in the S. of Scotland and in Ireland. It is found in most parts of the center and S. of Europe, at least during summer, being a bird of passage. It is of a greenish-brown color, the centers of the feathers dark brown, producing a spotted appearance; the lower parts pale brown. It is a shy bird, hiding itself in hedges and bushes, but very active, often darting out like a mouse from the bottom of the hedge, and receives its name from its chirping, grasshopper-like note.

WARBURG, FELIX M., an American banker, born in Hamburg, Germany, in 1871. He was educated in the public and high schools of his native town, came to America in 1894 and was naturalized in 1900. In 1895 he married a daughter of the late Jacob H. Schiff, becoming in the following year a member of the latter's banking firm, Kuhn, Loeb & Company, New York. He was vice-president of the New York Foundation, president of the Federation of Jewish Charities, chairman of the Joint Distribution Committee of funds for Jewish war sufferers, and a director or trustee of numerous charitable and educational societies and institutions, to which he contributed freely of his time and money.

WARBURTON, WILLIAM, an English prelate; born in Newark-upon-Trent, England, Dec. 24, 1698. He was brought up to the law, but not finding this profession to his taste, he relinquished it, and in 1723 took deacon's orders in the Church. In 1727 he began to distinguish himself as a writer by his inquiry into the "Causes of Prodigies and Miracles." This led to his being presented to the rectory of Brand Broughton, in Lincolnshire, where he remained many years, composing here most of those works which contributed to the establishment of his fame. In 1736 appeared his first important work, the "Alliance Between Church and State," etc., which brought him into favorable notice at court; but his great work is the "Divine Legation of Moses." It was assailed in many quarters, and Warburton carried on the controversy with ability and intemperate vigor. A defense of Pope's "Essay on Man" secured him the friendship of the poet, and he became a considerable beneficiary under the latter's will. By the death of Ralph Allen, whose niece he had married in 1745, Warburton succeeded



YELLOW WARBLER

to the splendid seat of Prior Park, in Gloucestershire. He was appointed, in 1746, preacher to the Society of Lincoln's Inn, and from that time his advance in Church preferment was rapid, till he became Bishop of Gloucester in 1759. He died in Gloucester, June 7, 1779.

WAR CAMP COMMUNITY SERVICE, an organization founded in May,

1917, by the Playground and Recreation Association of America, to assist communities located near the camps in which American soldiers were being trained, to make provision for recreation facilities of the men in their free time. The service extended over the United States and it was estimated that over 600 communities had been organized to provide recreation and hospitality. There was great variety in the activities to which the community service dedicated itself. Dramas were staged and local artistic talent was called on to provide the personnel, where it could not be provided by the men themselves. There were concerts, and many singers of note on various occasions gave their services. Pageants, more or less elaborate, and often of a kind to arouse the martial spirit of the men as well as to interest and instruct them were given. There were sporting carnivals, and athletic meets in which the men themselves took the major part. Many families gave hospitality to the soldiers, most of whom, when in camp, were at a great distance from their homes. Clubs were established in great numbers and where they were not formed on the actual initiative or by the direct organization of the War Camp Community Service, they became affiliated with it and enjoyed the facilities it provided. The total number of Soldiers' and Sailors' Clubs established exceeded 500, of which something like 60 were for colored soldiers. The central office and headquarters of the Service were maintained in New York, in the vicinity of which were several of the largest camps.

WAR, CIVIL. See CIVIL WAR, AMERICAN.

WARD, SIR ADOLPHUS WILLIAM, an English educator, literary historian, and biographer; born in London, Dec. 2, 1837; was educated at Cambridge. He was Professor of History and English Literature at Owens College, Manchester (1866); principal (1890-1897); Vice-Chancellor of Victoria University (1886-1890, and 1894-1896); Ford Lecturer at Oxford (1898); Master Peterhouse College, Cambridge, from 1900. He contributed to the "Encyclopædia Britannica" and leading English reviews, and wrote: "The House of Austria in the Thirty Years' War" (1869); "Dramatic Literature of the Age of Elizabeth" (2 vols. 1875); "Lives" of Chaucer (1879) and Dickens (1882) in the "English Men of Letters" series; "Great Britain and Hanover" (Ford Lectures, 1899); translator of Curtius's "History of Greece" (5 vols. 1868-1873); and editor of "Pope's Poems" (Globe edition, 1869), and of Byron's Poems" (Chetham Society's edition); "Germany, 1815-1900" (1916-1917).

WARD, ARTEMAS, an American military officer; born in Shrewsbury, Mass., in 1727; was graduated at Harvard College in 1748; entered public life at an early age as a representative to the General Assembly; and afterward became a member of the Executive Council. He served with distinction in the Revolutionary War, and was in command of the besieging forces at Boston till the arrival of General Washington, after which he was stationed with the right wing on Roxbury Heights. In consequence of impaired health he resigned his commission of Major-General, in April, 1776, but at the request of Washington continued to serve till the end of May. He was elected chief-justice of the Court of Common Pleas of Worcester county in 1776; was president of the Massachusetts Executive Council in 1777, and a member of the Legislature for 16 years; and served in Congress in 1791-1795. He died in Shrewsbury, Mass., Oct. 28, 1800.

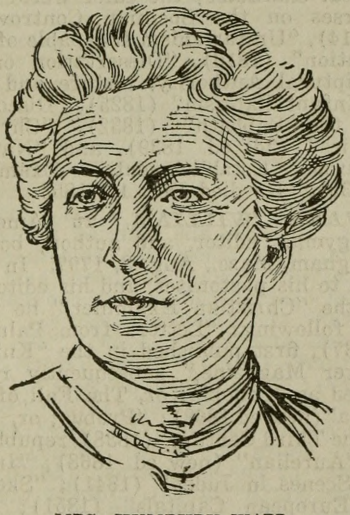
WARD, ARTEMUS. See BROWNE, CHARLES FARRAR.

WARD, ELIZABETH STUART PHELPS, an American novelist and poet; born in Boston, Mass., Aug. 31, 1844. In 1888 she married Herbert D. Ward, with whom she sometimes collaborated. Among her books are: "The Gates Ajar" (1868), one of the most successful of American stories; "Men, Women, and Ghosts (1869); "The Silent Partner" (1871); "The Trotty Book" (1869); "The Story of Avis" (1877); "Old Maid's Paradise" (1879); "Beyond the Gates" (1883); "Dr. Zay" (1882); "The Gates Between" (1887); "The Master of the Magicians" (1890); and "Come Forth" (1890). Jointly with her husband she wrote: "Poetic Studies," verse (1885); "Songs of the Select World" (1885); and "The Struggle for Immortality" (1889), a volume of essays. "The Story of Jesus Christ" (1897); "Walled In" (1907); She died in 1911.

WARD, HENRY AUGUSTUS, an American naturalist; born in Rochester, N. Y., March 9, 1834; became assistant to Prof. Louis Agassiz at the Harvard Scientific School in 1854; studied in Paris and traveled through Europe and the Orient in 1855-1859; was Professor of Natural Sciences in Rochester University in 1860-1865; and manager of gold mines in Montana and South Carolina in 1866-1869. In 1870 he began to travel in various countries, making large and valuable cabinets of mineralogy and geology, which he distributed among the

universities and colleges of the United States. He founded, at Rochester, N. Y., an establishment where these cabinets were prepared, taxidermy executed, and natural-science collections arranged; was acting naturalist on the United States expedition to Santo Domingo; and wrote "Notices of the Megatherium Cuvieri," and "Description of the Most Celebrated Fossil Animals in the Royal Museums of Europe." He died July 4, 1906.

WARD, MRS. HUMPHRY (MARY AUGUSTA ARNOLD), an English novelist; born in Hobart Town, Tasmania, June 11, 1851; eldest daughter of Thomas Arnold, second son of the great Dr. Arnold of Rugby. In 1872 she married Thomas Humphry Ward (born in 1845), the editor of "The English Poets" (4 vols. 1880-1881), "Men of the Reign" (1885), "Men of the Time" (12th ed. 1887), and "The



MRS. HUMPHRY WARD

Reign of Queen Victoria" (1887). She began early to contribute to "Macmillan's Magazine," and gave the fruits of her Spanish studies to Smith and Wace's "Dictionary of Christian Biography." A child's story, "Milly and Olly" (1881), "Miss Bretherton" (1884), a slight but promising novel, and the translation of Amiel's "Private Journal" (1885) prepared the way for the widely read spiritual romance of "Robert Elsmere" (1888). Its successor, "David Grieve" (1892), showed all its faults but hardly all its merits, and yet is said to have brought its author in the first two months no less than $90,000. "Marcella" appeared in 1894; a short story, "Bessie Costrell," in 1895; "Sir George Tressady," a sequel to "Marcella," in 1896; "Helbeck of Bannisdale" (1898); "Eleanor" (1900); "Lady Rose's Daughter" (1903); "The Case of Richard Meynell" (1911); "Eltham House" (1915); "England's Effort" (1916); "A Writer's Recollections" (1918). She died in 1920.

WARD, JOHN QUINCY ADAMS, an American sculptor; born in Urbana, O., June 29, 1830. In 1850 he entered the studio of Henry K. Brown, where he remained six years. In 1861 he opened a studio in New York, where he modeled his "Indian Hunter," "The Good Samaritan," Commodore M. C. Perry, with reliefs, "The Freedman," and many busts and small works. In 1869 he built a studio in Forty-ninth Street, New York, where he made the "Citizen Soldier," and statues of Shakespeare, General Reynolds, General Washington, General Israel Putnam, an equestrian statue of General Thomas, General Daniel Morgan and Lafayette. He built a larger studio in 1882, where he made the colossal statue of Washington for the New York subtreasury building, a colossal statue of President Garfield, "The Pilgrim," etc. He designed the crowning group of "Victory" in the arch for the Dewey reception in New York in 1899. He was vice-president, and for one term president of the National Academy of Design. He died May 1, 1910.

WARD, NATHANIEL, an English-American lawyer, clergyman, and author; born in Haverhill, England, about 1578. He emigrated to Massachusetts in 1634; lived in Ipswich (Agawam); returned to England in 1647. While a pastor in Massachusetts he wrote the "Body of Liberties," adopted December, 1641, the first code of laws established in New England. His other writings are: "The Simple Cobler of Agawam" (1647); "A Religious Retreat Sounded to a Religious Army" (1647); "A Sermon Before Parliament" (1647); and "Mecurius Anti-Mechanicus; or, The Simple Cobler's Boy, with his Lap-full of Caveats" (1648). He died in Shenfield, Essex, about October, 1653.

WARD, WILLIAM HAYES, an American editor, clergyman, and Assyriologist; born in Abington, Mass., June 25, 1835; was graduated at Amherst (1856); and at Andover Theological Seminary (1859). He was a pastor of the Congregational Church and professor at Ripon College in 1860-1868; became editor of the "Independent" in 1870. In 1884 he went to Babylon in charge of an exploring expedition. He wrote much on Oriental archæology for the "Bibliotheca Sacra," and other journals, and prepared the report of the expedition of 1884, and published "Biog-

raphy of Sidney Lanier" (1885), "Notes on Oriental Antiquities"; "The Seal Cylinders of Western Asia" (1910); "What I Believe and Why" (1915). He died in 1916.

WARDEN, DAVID BAILLIE, an Irish-American scholar; born in 1778. He was graduated at the New York Medical College, was United States secretary of legation at Paris, and subsequently consul from 1804 to his death. He was a member of the French Institute, and published: "Inquiry Concerning the Intellectual and Moral Faculties and Literature of the Negroes" (1810); "Origin and Nature of Consular Establishments" (1816); "Description of the District of Columbia" (1816); "Statistical, Political, and Historical Account of the United States" (1819); "L'Art de vérifier les dates: Chronologie Historique de l'Amérique" (Art of Verifying Dates: Historical Chronology of America, 10 vols. Paris, 1826-1844); "Bibliotheca Americana Septentrionalis" (North American Library), etc. (1820); "Recherches sur les Antiquités de l'Amérique Septentrionale" (Researches in North American Antiquities, 1827); and "Bibliotheca Americana" (1831). He died in Paris, Oct. 9, 1845.

WAR DEPARTMENT, one of the departments of the executive branch of the United States Government, headed by the Secretary of War, who is a cabinet official. The chief officers under the Secretary of War are the Chief of the General Staff Corps, Chief of the Militia Bureau, Adjutant General, Inspector General, Judge Advocate, Quartermaster General, and Surgeon General. Under the Bureau of Insular Affairs, the War Department administers the Philippine and Porto Rican governments, and the Dominican receivership. John W. Weeks of Massachusetts was appointed Secretary of War in 1921.

WARDLAW, ELIZABETH, LADY, a Scotch poet; born in 1677; the second daughter of Sir Charles Halkett, of Pitfirrane. She married in 1696 Sir Henry Wardlaw, of Pitreavie, also near Dunfermline. Her pseudo-archaic ballad, "Hardyknute, a Fragment," was first published in 1719 as a genuine antique, and, expanded from 216 to 336 lines, had been two or three times reprinted, when Percy in the second edition of his "Reliques" revealed the secret of its authorship. To Lady Wardlaw also Dr. Robert Chambers in 1859 ascribed "Sir Patrick Spens," "The Douglas Tragedy," and many more of the finest traditional Scotch ballads. Indorsed though it be by Professor Masson in his "Edinburgh Sketches" (1892), the theory is untenable; still our debt to Lady Wardlaw is a heavy one, for "Hardyknute," says Scott, was "the first poem I ever learnt, the last I shall ever forget." She died in 1727.

WARDLAW, RALPH, a Scotch Congregationalist; born in Dalkeith, Dec. 22, 1779. He studied at the University of Glasgow, and at the Selkirk "Hall" of the Burgher Synod; but, becoming dissatisfied with the tenets of that body and of Presbyterianism in general, he embraced the doctrines of the Independents. He held office in that body, first at Perth, then at Dumfries, and finally (1803) at Glasgow. He also (1811) became principal Professor of Theology at the "Hall" of his denomination in that town. In 1818 Wardlaw received the degree of D. D. from Yale College. He wrote a large number of works, chiefly of a polemical character; the chief were: "Discourses on the Socinian Controversy" (1814), "Unitarianism Incapable of Vindication" (1816), "Dissertation on the Scriptural Authority, Nature and Uses of Infant Baptism" (1825), "Discourses on the Sabbath" (1832), "Christian Ethics" (2d. ed. 1839), and "National Church Establishments Examined" (1839). He died Dec. 17, 1853.

WARE, WILLIAM, an American clergyman, editor, and author; born in Hingham, Mass., Aug. 3, 1797. In addition to his pastorates, and his editorship of the "Christian Examiner," he wrote the following: "Letters from Palmyra" (1837), first published in the "Knickerbocker Magazine," subsequently republished as "Zenobia; or, The Fall of Palmyra" (new ed. 1868); "Probus; or, Rome in the Third Century" (1838), republished as "Aurelian" (new ed. 1868); "Julian; or, Scenes in Judea" (1841); "Sketches of European Capitals" (1851); "Lectures on the Works and Genius of Washington Allston" (1852); and a "Life of Nathaniel Bacon," in Sparks' series. He edited "American Unitarian Biography" (1850). He died in Cambridge, Mass., Feb. 19, 1852.

WAREHOUSING SYSTEM, a customs regulation, by which imported goods may be lodged in public or bonded warehouses, at a reasonable rent, without payment of the duties on importation, till they be withdrawn for home consumption, thus lessening the pressure of the duties, which would otherwise cripple the purchasing power of the merchant. In the United States the warehousing system has been extended to other than imported goods. Thus spirituous liquors may be deposited by the manufacturer in government warehouses and payment of the internal revenue duty delayed till the

liquors are withdrawn. Liquors so held are said to be in bond.

WARFIELD, BENJAMIN BRECKINRIDGE, an American educator; born in Lexington, Ky., Nov. 5, 1851; was graduated at Princeton University in 1871; studied at the Princeton Theological Seminary and at the University of Leipsic; became Professor of New Testament Language and Literature in the Western Theological Seminary in 1878, and continued there till 1887, when he was called to the chair of didactic and polemical theology at Princeton Seminary. He was also editor of the "Presbyterian and Reformed Review," and the author of "The Divine Origin of the Bible"; "Augustine's Anti-Pelagian Treatise"; "The Right of Systematic Theology"; "On the Revision of the Confession of Faith"; etc.

WARFIELD, DAVID, an American actor, born at San Francisco, Cal., in 1866. He was educated in the public schools of his native town and made his first appearance on the stage at the Wigwam Theater, San Francisco, Cal., in 1889. In 1890 he came to New York, and from 1898 to 1900 he played there in the Casino Theater and in Weber and Field's Music Hall. In 1900 he came under the management of David Belasco and after that appeared with great success throughout the country in "The Auctioneer," "The Music Master," "A Grand Army Man," and "The Return of Peter Grimm."

WARFIELD, ETHELBERT DUDLEY, an American educator; born in Lexington, Ky., March 16, 1861; was graduated at Princeton University in 1882 and at the Columbia College Law School in 1885; practiced law in Lexington, Ky., in 1886-1888; was Professor of History in Miami University in 1888-1891; became president and Professor of History in Lafayette College in 1891, serving until 1914 when he was chosen president of Wilson College. His publications include "The Kentucky Resolutions of 1798; an Historical Study"; "At the Evening Hour"; and "Memoir of Joseph Cabell Breckenridge, U. S. N."

WAR FINANCE CORPORATION, an organization established in 1918 for the purpose of supporting banking and industrial credit during the war. The plan was advocated before the Senate Finance Committee in February of that year by Secretary of the Treasury McAdoo, and after it had been considered in Congress the bill received the approval of the President. It provided for a corporation with $500,000,000 capital, subscribed by the Government, and authorized to issue $3,000,000,000 of notes toward enterprises regarded as essential to the prosecution of the war. Discount of the corporation notes at the Federal Reserve Banks were provided for, but the corporation notes were not to be available as a basis for the issue of Federal Reserve notes. In April, 1919, the corporation had a $200,000,000 issue of bonds, which were put on sale at par and interest through the Federal Reserve Banks as fiscal agents. They were in denominations of $1,000, in bearer form, to run for one year from April 1, 1919, bearing interest at 5 per cent., payable semi-annually. They were exempt, both as to principal and interest, from all taxation now or hereafter imposed by the United States, or by any local taxing authority, except estate or inheritance taxes, and graduated additional income taxes, known as surtaxes, and excess profits and war profits taxes. The proceeds from the sale of the bonds were used for the general purposes of the corporation. Considerable amounts were taken up by advances to the railroads and other sums were docketed as likely to be necessary in the financing of commerce abroad. To this bond issue there were a large proportion of subscribers who bought in small amounts and as a result large blocks of securities remained in the banks. Later the corporation was stated to be buying back its own bonds, and notices were given out that it would redeem any of its bonds at 99.15.66. One of the functions committed to the War Finance Corporation was the duty of investigating and determining whether issues of securities by private concerns were compatible with the national interest, the Capital Issues Committee being created to attend to this work. The primary object of this committee was to see that no money which might be valuable in the prosecution of the war might be expended in unnecessary directions. In reply to inquiries in the Senate in October, 1918, as to the corporation it was stated that it had 28 people in its employ, the compensation to them amounted to $6,229.83 per month, expenses being paid out of earnings.

WAR INDUSTRIES BOARD, a body the object of which was to concentrate control over the industries of the United States so as to meet the requirements of the war in an efficient manner. The board was dissolved at the end of 1918, it being held that its duties had ceased with the conclusion of the war, and that restrictions that had been laid on the industries of the country should be lifted as soon as possible. Before the ending of its activities by the order of the President

many of the divisions of the board had already been disbanded, but provision was made for the continuance of certain of the board's activities by other departments of the Government. The War Trade Board took over the duties of the Division of Planning and Statistics. The Bureau of Markets of the Department of Agriculture took over the powers and duties of the Wool Division of the Board. The Price Fixing Committee was still held as being capable of doing valuable work. It was commissioned to continue performing its functions until all the prices fixed by the committee and not expiring by Jan. 1, 1919, had expired. Such other divisions of the War Industries Board as could not be dispensed with were reorganized and placed under the War Trade Board, the expenditure on behalf of which, it was arranged, would be paid out of the appropriations of the War Industries Board.

The Board had justified its existence from the beginning. It served in creating order out of the industrial confusion that followed the earlier part of the war. It was a development of the advisory commission of the Council of National Defense whose duty it was to settle questions of priority, the distribution of supplies, and the elimination of wasteful competitive bidding for labor and materials. This Advisory Commission had, in March 1917, organized committees of transportation and communication; munitions and manufacturing; supplies; raw materials, minerals and metals; engineering and education; labor; and medicine and surgery. The reorganization of the commission as the War Industries Board greatly strengthened the work. The board constituted for American industry an element similar to that of the general staff in an army. It standardized the products, made labor more efficient, and had a reorganizing influence in almost every division of the industries of the country. When it was dissolved it had introduced methods that became permanent, and as a result of it services were established that have proved useful in the period of reconstruction.

WAR LABOR POLICIES BOARD, a union of bureaus under the Secretary of Labor during the war with matters of employment, housing, wage adjustments, and the like. It was formed in May, 1918, as the result of advice given by an advisory labor council called together for that purpose. The duty of the board was to co-ordinate the industrial services represented by the numerous other organizations that were assisting the Government. Its aim was to standardize conditions of employment, to investigate questions involving wages, hours, the distribution of labor and the arrangement of working conditions. Committees were formed on inquiry, Government contract clauses, recruiting, exemption of skilled labor, centralization of industrial statistics, and the like. It succeeded in establishing a national system of labor exchanges, and in standardizing wages in several important industries. It was dissolved in February 1919, its staff having been greatly reduced by that time, and the funds necessary for its support not being forthcoming, when the Labor Appropriations Bill failed to pass.

WARM-BLOODED ANIMALS, the name given to mammalia and aves or birds, in contradistinction to fishes, amphibians, and reptilia, as lower vertebrata, and to all invertebrate animals. In the latter, the blood is only a degree or two warmer than the medium in which they live, while in mammals and birds the blood greatly exceeds the outer temperature in heat. The average mammalian temperature varies from 99° F. to 100° F., as in man and his nearest allies, to 103° F. in the whales. In birds, which are the warmest-blooded animals, the lowest temperature is about 104° F., and may range to 110° or 112° F. This would represent an excessive fever heat in man. In hibernating animals the temperature falls considerably, as the tissue waste is reduced to its minimum. The production of heat depends on the union of oxygen in the blood with carbon and hydrogen in the tissues; active habits, as in birds, demanding a large supply of oxygen, and producing heat accordingly.

WARNECK, GUSTAV ADOLF (vär' nek), a German theologian; born in Naumburg, March 6, 1834. He wrote: "Missions in the Light of the Bible" (1878); "The Relations between Missions and Modern Civilization" (1879); "The Mission in Pictures from its History" (1884); "Sketch of the History of Missions from the Reformation to the Present Time"; "The Ultramontane Art of Fence" (1889); "The Romanism of Today in the Light of its Missions to the Heathen" (1889); "The Evangelical Alliance and its Opponents" (1889); "Position of the Evangelical Mission Toward the Question of Slavery" (1889). He died in 1910.

WARNER, ANNA BARTLETT, pen name AMY LOTHROP, an American author; born in New York, in 1820. In conjunction with her sister, Susan Warner, she published the novels "Say and Seal" (1860); "Wych Hazel" (1876); and "The Gold of Chickaree" (1876). Among her

separate works, published under her pen name, are: "Dollars and Cents" (1853); "My Brother's Keeper" (1855); "Stories of Vinegar Hill" (1871); "The Fourth Watch"; "The Blue Flag," etc. (1879); "The Other Shore"; "Three Little Spades," a child's book; "Gardening by Myself"; "Up and Down the House"; "Pond Lily Stories"; "Miss Muff"; etc. She died in 1915.

WARNER, CHARLES DUDLEY, an American editor and author; born in Plainfield, Mass., Sept. 12, 1829; was graduated at Hamilton College in 1851; admitted to the bar in 1856, and practiced in Chicago till 1860, when he removed to Hartford, Conn.; became editor of the "Press" in 1861, and of the "Courant" on its consolidation with the "Press" in 1867. He was connected with "Harper's Monthly Magazine," in charge of an editorial department for many years from 1884. His first book was a compilation for the use of students in schools, called "A Book of Eloquence" (1853). In 1870 he published "My Summer in a Garden," which was followed by "Saunterings" (1872); "Backlog Studies" (1872); "The Gilded Age" (with S. L. Clemens, 1873); "Baddeck, and That Sort of Thing" (1874); "In the Levant" (1877); "Being a Boy" (1877); "In the Wilderness" (1878); "Studies of Irving" (with W. C. Bryant and George P. Putnam, 1880); "Life of Washington Irving" (1881); edited "American Men of Letters" (of this series "Washington Irving," 1881, was the initial volume; the thirteenth volume, "George William Curtis," by Edward Cary, appeared in 1894); "The Golden House: A Novel" (1894); "The Relation of Literature to Life" (1896); "The People for Whom Shakespeare Wrote" (1897); edited "A Library of the World's Best Literature" (1896-1898). He died in Hartford, Conn., Oct. 20, 1900.

WARNER, OLIN LEVI, an American sculptor; born in Suffield, Conn., April 9, 1844; early manifested a taste for sculpture; and first studied in the École des Beaux Arts in Paris and later was a student in Carpeaux's studio. In 1872 he returned to the United States and opened a studio in New York City. In 1877 Daniel Cottier, an art dealer, invited him to place some of his work on exhibition in his rooms. This brought Mr. Warner's work under the eye of several critics who gave it favorable commendation. In 1877-1878 he modeled "Twilight," a small statue, which established his reputation. His works include "The Dancing Nymph"; "Cupid and Psyche"; reliefs of Joseph and other Indian chiefs; busts of J. Alden Weir, Miss Maude Morgan; and statues of Governor Buckingham of Connecticut, William Lloyd Garrison, General Devens; etc. He died in New York City, Aug. 14, 1896.

WARNER, SUSAN, pen name ELIZABETH WETHERELL, an American novelist; born in New York, July 11, 1819. Her books are: "The Wide, Wide World" (1850); "Queechy" (2 vols. 1852); a theological treatise, "The Law and the Testimony" (1853); "The Hills of the Shatemuc" (1856); "Lyrics from the Wide, Wide World"; "The Golden Ladder" (1862); "The Old Helmet" (1863); "Wych Hazel" (1876); and an essay, "American Female Patriotism." She died in Highland Falls, N. Y., March 17, 1885.

WAR OF 1812, the second serious conflict between Great Britain and the United States. It lasted for over two and a half years, beginning June 19, 1812, and ending with the treaty of Ghent, which was signed Dec. 24, 1814, and ratified Feb. 18, 1815. The principal cause of this war was the interference of Great Britain with American vessels, which she caused to be stopped on the high seas and searched for British subjects who were forced into the navy or imprisoned for refusing to serve. Several times American men-of-war were fired on and compelled to give up seamen in their crews. Great Britain also interfered with our commerce by her blockades and Embargo Act, and a bitter feeling was aroused. James Madison, at that time President of the United States, was personally opposed to a war, but was overruled by Congress, which appropriated large sums for the army and navy. See UNITED STATES, HISTORY.

WARRANT, to give a guaranty to; to authorize; to give power or authority to, as to do or forbear anything, by which the person authorized is secured or held harmless from any loss, damage, or detriment by such act; as, these thoughts cannot warrant you from suspicion in others. To declare with assurance or confident anticipation; as, I warrant he who is born to be hanged will never be drowned. To justify; to maintain, support, or verify by authority, proof, or evidence; as, one is warranted in assuming this to be a fact. In law, to assure; to secure to, as a grant to a guarantee. To secure, as the valid title of goods to a purchaser; or, to provide indemnification in the event of loss. To guarantee to a purchaser the quality or quantity of goods or articles sold, as being equal to that which they are represented to be; as warranted Sheffield cutlery.

An act, instrument, or obligation, by which one person authorizes another to do something which he has not otherwise

a right to do; an act or commission investing one with a certain right, power, or authority, and thus securing him from loss, damage, or detriment; anything which warrants, authorizes, or justifies the doing of; as, the breaking of rules by others is no warrant for our doing so likewise. That which serves as guaranty, security, or assurance for anything; as, his word alone is sufficient warrant. A voucher; that supplies proof or attestatation; as, a pretender to piety backs his imposture by Scriptural warrant. A writing or document which empowers a person to receive money, goods, or other thing or things; as, a warrant for the transfer of bonded spirits.

In criminal law, the authority issued by a justice of the peace for the apprehension of some one. The warrant should be under hand and seal of the justice; should set forth the time and place of making it, and the cause for which it is made; and should name the person against whom it is granted. It is good for the county in which it is issued, but cannot be enforced in another without being backed by a justice of that county. The officer is justified in apprehending the party at any time, and even in breaking open the doors of a house in pursuit of him.

WARRANT OFFICER, one of the highest ranks to which seamen under ordinary circumstances can attain. They are divided into three classes—gunners, boatswains, and carpenters, the gunners taking precedence of the other two. Formerly, before ironclads superseded wooden ships, there was only one officer of this rank of each class carried on board even the largest ships. Now, in addition to the officer of each class appointed to carry out the special duties of gunner, boatswain, and carpenter on board every ship, there are usually three or four junior gunners or boatswains appointed to battleships and some of the larger of other classes of ships to perform what are called quarter-deck duties, in addition to which in many of the larger ships an extra gunner or boatswain is appointed for torpedo duties. A certain proportion of these officers who have duly qualified in navigation are now appointed to command torpedo boats.

WARRANTY, in law, a promise or covenant by deed, made by the bargainer, for himself and his heirs to warrant or secure the bargainee and his heirs against all men in the enjoyment of an estate or other thing granted. The use of warranties in conveyances has long been superseded by covenants for title, whereby, as the covenanter engages for his executors and administrators, his personal as well as his real assets are answerable for the performance of the covenant.

Also, any promise (expressed or implied by law, according to circumstances) from a vendor to a purchaser, that the thing sold is the vendor's to sell, and is good and fit for use, or at least for such use as the purchaser intends to make of it. Warranties in insurance are absolute conditions, non-compliance with which voids the insurance. When express, these warranties should appear in the policy, but there are certain implied warranties.

WARREN, a city and county-seat of Trumbull co., O.; on the Mahoning river, and on the Baltimore and Ohio, the Pennsylvania, and the Erie railroads; 55 miles S. E. of Cleveland. Here are graded schools, waterworks, street railroad and electric light plants, National and State banks, and several daily and weekly newspapers. The city has machine shops, planing, flour, rolling, paint, and saw mills, boiler, linseed oil, evaporator and tube works, and steel, bath tub, electric lamp, and other factories. Pop. (1910) 11,081; (1920), 27,050.

WARREN, a borough of Pennsylvania, the county-seat of Warren co. It is at the junction of the Allegheny river and of the Conewango Creek, and is on the Pennsylvania and the New York Central railroads. Its industries include oil refining and the manufacture of furniture, iron and steel, chemicals, boilers, gas engines, etc. It has a State Hospital for the Insane, and two public libraries. Pop. (1910) 11,080; (1920) 14,272.

WARREN, FRANCIS EMROY, a United States Senator from Wyoming. He was born in Hinsdale, Mass., in 1844, and received an academic education. He served in the Civil War, receiving the Congressional Medal of Honor for gallantry. Following the war, he engaged in farming and stock raising in Massachusetts, until 1868, when he removed to Wyoming. He filled various offices in the Territorial Government, and was mayor of Cheyenne until 1885, when he resigned to be territorial governor. For three terms he was treasurer of Wyoming Territory. In 1890 he was elected first governor of the State of Wyoming. Following his election as United States Senator in the same year, he resigned. He was five times re-elected Senator.

WARREN, GOUVERNEUR KEMBLE, an American military officer; born in Cold Spring, N. Y., Jan. 8, 1830; was graduated at the United States Military Academy in 1850, and was brevetted 2d

lieutenant of Topographical Engineers; was engaged in river surveys, and in exploring and making maps for railroad routes between the Mississippi river and the Pacific Ocean in 1850-1859; and was assistant Professor of Mathematics at the United States Military Academy in 1859-1861. When the Civil War broke out he became lieutenant-colonel of the 5th New York Volunteers and colonel in August, 1861. He was promoted captain of United States Engineers, Sept. 9, 1861; promoted Brigadier-General of volunteers in September, 1862, for his gallantry at Gaines' Mills, and chief of topographical engineers in February, 1863. In March of the same year he was made chief of engineers in the Army of the Potomac. During the battle of Gettysburg, while on the staff of General Meade, he ordered the 140th New York regiment to seize Little Round Top. After a sharp hand-to-hand struggle this hill, which was the key to the whole Union position, was carried. He was promoted Major-General of volunteers in May, 1863, and in March, 1864, when the Army of the Potomac was reorganized he was placed in command of the 5th corps. He distinguished himself in the battles of Marye's Heights, Chancellorsville, Salem, the Wilderness, North Anna, Bethesda Church, Cold Harbor, Five Forks, etc. At the instance of General Sheridan, who accused General Warren to General Grant of criticizing the acts of his superior officers, he was relieved from the command of his corps, but was later vindicated by a court of inquiry. Shortly after this he was placed in command of the Department of the Mississippi. In June, 1864, he was promoted major of United States Engineers, which post he assumed in May, 1865, when he was mustered out of the volunteer service. He was brevetted Major-General U. S. A. in March, 1865, and promoted lieutenant-colonel in March, 1874. His publications include: "Explorations in the Dakota Country" (1855-1856); "Preliminary Reports of Explorations in the Nebraska and Dakota in the Years 1855-1857" (1858); and "An Account of the 5th Army Corps at the Battle of Five Forks" (1866). He died in Newport, R. I., Aug. 8, 1882. A statue was erected to his memory on Little Round Top, Gettysburg, Pa., in 1888.

WARREN, JOSEPH, an American patriot; born in Roxbury, Mass., June 11, 1741. He was graduated at Harvard College in 1759, studied medicine, and settled in Boston, where he soon acquired an extensive practice. He warmly embraced the cause of the colonies in the controversy with the British Government, and, in 1772, was made a member of the committee of correspondence formed for the purpose of communication with the several towns in Massachusetts. In 1774, he was elected a delegate to the Massachusetts congress, of which he was made president, and also chairman of the committee of public safety. On June 14, 1775, he received a commission as Major-General; and when a majority of the council of war determined to fortify Bunker Hill, he insisted on having a share in the action that would take place. As he was warned by Elbridge Gerry against the hazard of exposing his person: "I know that I may fall," was the answer of Warren, "but where is the man who does not think it glorious and delightful to die for his country?" He was killed at the battle of Bunker Hill, June 17, 1775. His statue, by Henry Dexter, was unveiled on Bunker Hill, June 17, 1857.

WARREN, MERCY OTIS, an American patriot; born in Barnstable, Mass., Sept. 25, 1728. An ardent patriot, she corresponded with the leaders of the Revolution, among them Samuel and John Adams, and Thomas Jefferson. The "Correspondence of John Adams and Mercy Warren" was published by the Massachusetts Historical Society in 1878. She wrote dramatic and satirical poems against the Royalists (1773-1775), which were included in her volume of "Poems, Dramatic and Miscellaneous" (1790). She published "A History of the Rise, Progress, and Termination of the American Revolution, Interspersed with Biographical, Political, and Moral Observations" (3 vols. 1805). She died in Plymouth, Mass., Oct. 19, 1814.

WARREN, SAMUEL, a British novelist; born in Denbighshire, Wales, May 23, 1807. He studied medicine at Edinburgh and law at the Inner Temple, and was called to the bar in 1837. He was made a Queen's Counsel (1851), was Recorder of Hull (1854-1874), represented Midhurst in the Conservative interest (1856-1859), and then he was appointed one of the two Masters of Lunacy. His "Passages from the Diary of a Late Physician" (1832) had been contributed to "Blackwood's Magazine," as also was "Ten Thousand a Year" (1841), the amusing story of "Tittlebat Titmouse." By these he is chiefly remembered; but he published a dozen more works, including "Now and Then" (1847), "The Lily and the Bee" (1851), and several law books. He died in London, July 29, 1877.

WARREN, WHITNEY, an American architect. He studied at the Ecole des Beaux Arts, Paris, and began the practice of architecture in New York. He established the firm of Warren and Wetmore. He was awarded the silver medal at the Paris Exposition for excellence in sculptural work. During the World War he spent much time in France and Italy in relief work, and made a careful examination and report on the condition of the Rheims Cathedral. In 1921 he was given the commission of rebuilding the library of Louvain, which was burned by the Germans during the invasion of Belgium in 1914.

WARRINGTON, a municipal and parliamentary borough and manufacturing town of Lancashire, England, on the right bank of the Mersey, 18 miles E. of Liverpool, 16 W. S. W. of Manchester, and 182 N. W. of London. Though of recent development, it is an ancient place, the Wallingtun of Domesday; and, acquiring strategic importance through its bridge (1496) over the Mersey, it was the scene of defeats of the Scots (1648), the Royalists (1651), and a portion of Prince Charles Edward's forces (1745). To a dissenting academy, founded in 1757, it owes its memories of Drs. Aikin, Priestley, Taylor, etc.; and Lucy Aikin was a native. The parish church, St. Elphin's, with a spire 300 feet high, is a fine cruciform Decorated structure, restored in 1859-1867 at a cost of over $75,000. Other buildings are the town hall, the Royal Court theater (1862), postoffice (1876), hospital (1876), museum and library (1857), school of art (1882), public baths (1866), grammar school (1526; rebuilt 1857), etc. There are also public gardens and a park. The manufactures include iron, wire, pins, files, cottons, glass, leather, and soap. Pop. about 75,000.

WAR RISK, a name given by insurance men to policies written on property obnoxious to destruction or damage by reason of a war then being waged; applied generally to marine insurance.

WAR RISK INSURANCE. Following its entrance in the World War, the United States undertook to perfect plans for the insurance of soldiers. Such a plan was finally adopted on October 6, 1917. This provided compensation and insurance for soldiers. By the terms of the measure, which provided for insurance, any person, male or female, in active military service, might take out insurance in multiples of $500 for any sum between $1,000 and $10,000. By March 15, 1918, over 1,500,000 persons in the army and navy had been insured for over $12,000,000,000, and by the end of the year, over 4,000,000 persons had been insured, for about $37,000,000,000. Up to May, 1919, death awards for insurance amounting to $785,613,500 had been paid to 102,286 beneficiaries. In addition to the life insurance phase of the war risk plan, there were compensation and disability benefits, ranging in amounts from $1,000 to $10,000. Practically 95 per cent. of the personnel of the army and navy and nursing corps, with an average figure of $8,700, had taken out insurance. Arrangements were made following the close of the war for the transference of these premiums for regular life insurance premiums of different kinds.

WARSAW, a city of Poland; formerly the capital of the Polish kingdom; under Russian rule the capital of the government of Warsaw; and since November, 1918, the capital of the Polish Republic and the seat of its government; situated on the Vistula, being connected with Praga, its fortified suburb, by a floating bridge. Warsaw consists of an old and new town, independent of its suburbs; the place is one of great antiquity and many of its ancient houses and streets are quaint and picturesque; the new town contains some attractive boulevards and handsome buildings, squares and parks. The chief edifices are the council house, a collegiate church, the barracks, Tamek or palace of the ancient kings, now used to house government offices, and containing the diet hall, and all the national archives; several statues, some private palaces of the nobility, with the castle and an equestrian statue of Sobieski. The manufactures are woolen stuffs, soap, tobacco, gold and silver wire, hats, hosiery, paper, chemicals, carriages, harness, etc. It is the center of industry, commerce, and literary activity, and the great entrepôt of commerce of Poland. The university, suppressed by the Emperor Nicholas after the insurrection of 1830, was subsequently re-established through the influence of the Grand-Duke Constantine. In 1566 Warsaw succeeded Cracow as the capital of Poland. In 1793 Kosciusko retreated on Warsaw, and defended it with success against the Prussians, during the summer of 1794; but, on the arrival of Suwarrow and the Russians, Praga, a suburb of the city, was taken and destroyed. Under Russian rule Warsaw was for many years the residence of a viceroy representing the Emperor of Russia; it was also the place of meeting of the Polish parliament. In 1830 the Russians were driven from it by the

Poles; but it was, in the following year, retaken. As a result of its position, the city was especially exposed during the World War. It was strongly protected by the Narev river and by a string of strong fortresses and several attempts of the Austro-German forces to capture it failed. In 1915, however, after the fall of the Narev fortresses, the city was evacuated by the Russians and it was occupied on Aug. 5, 1915, by Austro-German troops, who held it until the end of the war. Pop. (1919) about 820,000. See POLAND.

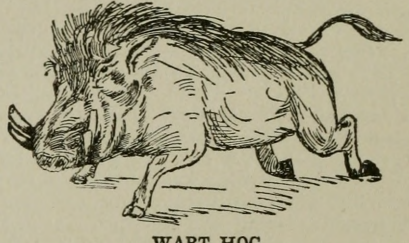
WARSHIPS. See NAVY: BATTLESHIP.

WART, known in surgery by the Latin name *Verrucæ,* a collection of lengthened papillæ of the skin, closely adherent and ensheathed by a thick covering of hard-dry cuticle. From friction and exposure to the air the surface presents a horny texture, and is rounded off into a small button-like shape. Such is the description of the simple wart, which is so commonly seen on the hands and fingers (and rarely on the face or elsewhere) of persons of all ages, but especially of children. Among other varieties of warts are (1) one to which the term *Verruca digitata* has been applied. It is more elongated in shape, and less protected by cuticle than the preceding. It is said to occur nowhere but on the scalp of women of adult age, and sometimes to occasion great annoyance in brushing and combing the hair. (2) Subungual warts, growing, as their specific name implies, beneath or at the side of the finger or toe nails. They originate beneath the nail, and as they increase they crop out either at the free extremity or the side of the nail, and are usually troublesome, and often very painful. They are generally of syphilitic origin. (3) Venereal warts, caused by the direct irritation of the discharges of gonorrhœa or syphilis, and occurring about the parts which are liable to be polluted with such discharges. They attain a larger size, and are more fleshy and vascular than other warts.

WARTBURG, CASTLE OF, a notable structure in Eisenach, Saxe-Weimar, on an eminence rising 600 feet above the town, engirt by forests, founded in 1067, and till 1440 the residence of the Landgrave of Thuringia. It is famous as the spot where the MINNESINGERS (*q. v.*) assembled to hold a poetic contest ("the war of the Wartburg") about 1207; as the home of St. Elizabeth (1211-1227); and as the 10 months' asylum to which Luther was carried by the Elector of Saxony (May, 1521). The chapel in which Luther preached, as well as the chamber which he occupied, and in which he discomfited the Evil One by throwing the inkstand at his head, is still pointed out. The whole pile has been magnificently restored since 1851.

WARTHE, the principal tributary of the Oder river; rises near Kromolov, in Poland; flows N.; at Kolo turns to the W.; at Schrimm again to the N.; at Obornik to the W.; at the influx of the Obra finally to the N.; at the influx of the Netze enters on the Wartebruch, a swampy tract 46 miles long by 9 wide, and joins the Oder at Küstrin, where it is 640 feet broad. Its tributaries are, from the right the Netze and Küddow, from the left the Prosna and Obra. Its total length is 487 miles.

WART HOG, African hog of the genus *Phacochœrus.* These hogs resemble the true hogs in most of their characters, and particularly in their feet, but remarkably differ from them in their dentition: The number of teeth is much



WART HOG

reduced; the canines become the large tusks, and in the adult the last molar only is found in each jaw, which grows to an enormous size as in the elephant.

WARTON, JOSEPH, an English clergyman, critic, and editor; born in Dunsfold, England, in 1722. He wrote: "Odes on Various Subjects" (1746); a poetical translation of the "Eclogues and Georgics of Vergil" (1753; 24 critical papers to the "Adventurer" (1753-1756); an "Essay on the Genius and Writings of Pope" (2 vols. 1757-1782). He edited the works of Pope (9 vols., 1797); and the works of Dryden (4 vols., 1811; completed after his death). He died in Wickham, Feb. 23, 1800.

WARTON, THOMAS, an English poet and critic, son of the Rev. Thomas Warton, Professor of Poetry at Oxford; born in Basingstoke, England, in 1728. He was educated at Winchester, and Oxford, and early distinguished himself by his poetical compositions and criticisms. He was chosen Professor of Poetry at Oxford in 1757, a chair he filled with great ability for 10 years; appointed

Camden Professor of History in 1785; and he succeeded Whitehead as poet-laureate in the same year. Several church livings were also held by him. He rendered great service to literature by his "History of English Poetry" (1774-1781, three vols.), a work never completed. He died in Oxford, May 21, 1790. His brother, JOSEPH (1722-1800), also deserves mention as a literary critic, and as headmaster of Winchester School (1766-1796). To him we owe an essay on the "Writings and Genius of Pope."

WAR TRADE BOARD, a body established by executive order Oct. 12, 1917, under the Trading with the Enemy Act. It was a development of the Exports Administration Board and of the division of export licenses of the Department of Commerce, which had dealt with exports only. The new body dealt with exports and imports and performed other duties under the Trading with the Enemy Act. Its chairman represented the secretary of state, and other members represented the Departments of the Treasury, Agriculture and Commerce, the Food Administration and Shipping Board. It grew in importance and soon had 2,300 people in its employment. It was represented by numerous branches in American ports and in neutral and allied countries. It had a contraband committee, with numerous bureaus, as well as bureaus or committees dealing with exports, branches and customs, imports, transportation, enemy trade, war trade intelligence, research, tabulation and statistics, and foreign agencies. Commodities in foreign trade were subjected to licensed control by the board. The board was enabled to use its powers to negotiate with other countries for the exchange for exports for shipping facilities. Agreements were entered into with European neutrals in regard to food, raw materials, and manufactured goods. In such cases guarantees were to be given against re-export to enemy countries. Under such agreements shipments of food, fodder, chemicals and the like were permitted to go to Norway, Holland, Switzerland and other neutral countries. There was also a certain amount of supervision exercised over traffic by rail and water, and to prevent overcrowding in the Atlantic ports licenses to export were established. It continued to function after the cessation of hostilities, and upon the signing of the armistice it removed by degrees commodities from the Export Conservation List and increased the commodities on the Free List. It sought on the arrival of peace to stimulate the resumption of normal trade relations, a policy that was being put into effect in all the belligerent countries. In May, 1919, the powers and duties of the board together with its personnel and records were transferred to the Department of State. Licenses continued to be valid with certain restrictions dealing with the importation and exportation of wheat, powers in regard to which had been transferred to the United States Wheat Director.

WARWICK ("the fortified place"), the county-town of Warwickshire, England, 107¾ miles N. W. of London; chiefly situated on the S. shore of the Avon. On the opposite bank, crowning a solid rock, stands Warwick Castle, rearing its towers, Cæsar's (147 feet) and Guy's (128 feet), above the cedars of the surrounding park and storing within its state apartments rich tapestries, pictures by Rembrandt, Van Dyck, and Rubens, collections of armor and other rarities, among them the famous "Warwick vase." St. Mary's Church, mainly rebuilt in 1704, retains its old Perpendicular choir and Beauchamp chapel (1370-1391), with the tombs of four centuries of Warwick's earls; over the E. gate is an ancient chapel, till recently used as a free school; and Leicester's Hospital, founded for 12 brethren in 1571, is a quaint quadrangular building, with a Gothic chapel surmounting the Warwick Gate, a mighty kitchen, and vaulted hall, profusely adorned with its founder's cognizance, the Bear and Ragged Staff. The town itself, having suffered much from fire, is generally modern, among the prominent buildings being a Roman Catholic Church, the county hall and courts, a domed market house, the county jail, a theater, and antiquarian museum. Iron founding, brewing, and brickmaking are carried on, but agricultural produce forms the staple of the trade of Warwick. Pop. about 15,000. Traditionally connected with King Cymbeline, its reputed founder in A. D. 1, and with Guy of Warwick, the vanquisher of the giant Colbrand, Warwick figures in "Domesday" with 261 houses, having earlier been sacked by Danes, but restored by Ethelfleda, Ælfred's daughter, in 914. William of Newburgh, a follower of the Conqueror, replaced her fortress by the castle, which Stephen surrendered to Prince Henry (1153), which was Edward IV.'s prison (1469), and which has been visited by many of England's kings. See Hawthorne's "Our Old Home."

WARWICK, a town of Rhode Island, which includes several villages in Kent co. It is on Narragansett and Cowesett bays, the Pawtuxet and Providence rivers, and on the New York, New Ha-

ven and Hartford railroad. Its industries include foundries, machine shops, thread mills, a bleachery, etc. The town, however, is chiefly residential. In 1912 it was divided, about 8 square miles being set apart and called West Warwick. Pop. (1910) 26,629; (1920) 13,481.

WARWICK, RICHARD NEVILLE, EARL OF, "the king-maker," born about 1428; the eldest son of the Earl of Salisbury, and by his marriage with the heiress of the Beauchamps himself became Earl of Warwick (1449). In the Yorkist victory of St. Albans (1455), the opening action of the Wars of the Roses, he fought on the winning side, and three years later sharing in the reconciliation between the hostile parties, was appointed lord-deputy of Calais and admiral of the fleet. As such he gained a splendid success over the Spaniards, but a quarrel between his followers and the king's led to charges of his disloyalty, which he justified by taking the field at Ludlow with his cousin the Duke of York (1459). On the failure of that attempt he again with the Earls of Salisbury and March withdrew to Calais, a town devoted to his cause, and thence in the following summer recrossed to Kent, and, mastering London and capturing Henry VI. at Northampton, brought about the compromise by which Henry was to reign for life but acknowledging York for his successor.

Margaret of Anjou would not thus tamely surrender the rights of her son, and first routing and slaying York and Salisbury at Wakefield advanced to St. Albans, where a second battle ended in Warwick's defeat. Warwick, however, joined the young Earl of March (now Duke of York), and striking with him boldly on London, placed him on the throne as Edward IV., then chasing the Lancastrians back to Yorkshire, almost annihilated them on the bloody field of Towton, March 29, 1461. Possessed of immense domains and princely wealth, with one brother rewarded for his crowning victory at Hexham by the earldom of Northumberland, another made Primate and Lord Chancellor, Warwick indeed seemed able now, in Shakespeare's words, "to do and undo, as him pleased best." Edward's marriage, however, to Elizabeth Woodville pleased him not, especially as he was then negotiating for the king's alliance to Bona of Savoy; neither did the marriage of Edward's sister to Charles of Burgundy, the earl's great foe. In retaliation Warwick bestowed his daughter on the Duke of Clarence, and after seizing on Edward's person, executing the queen's father and brother, and seeming to accept a pardon, involved himself in the insurrection of Sir Robert Welles (1470), for making Clarence king.

Its failure drove him once more to France, where, through the mediation of Louis XI., Warwick engaged to restore the crown to Henry VI., and Margaret to wed her son to Warwick's daughter Anne. His landing in Devonshire came like a thunderclap to Edward IV., who from the north, where he was busy quelling a revolt, escaped to Burgundy, leaving Warwick master of the kingdom. The triumph was brief, for when Edward returned in six months' time, Warwick found himself treated as he had treated others, and after fruitless overtures for a fresh desertion, he with his brother was routed and slain at Barnet, April 14, 1471.

WAR ZONES, those areas of the high seas which were officially designated as dangerous by the belligerent countries during the World War. Immediately after the outbreak of hostilities it became obvious that the Germans had strewn the waters of the North Sea with mines. In retaliation, and to prevent the escape of raiders from German ports, the British Admiralty announced in October, 1914, that it would have to follow "a mine-laying policy in certain areas." A few months later these "areas" were made to include the whole of the North Sea, with the exception of certain lanes of safety, along which British war vessels guided friendly neutrals. In February, 1915, Germany proclaimed all the waters about the British Isles a war zone, with no safety lanes, announcing that all vessels entered this area at the risk of being sunk without warning. In January, 1917, Germany extended this zone down to include the French coasts in the Mediterranean, altogether including an area of over a million square miles.

WASH, a wide estuary on the E. coast of England; between the counties of Lincoln and Norfolk; 22 miles in length and 15 in average breadth. It is surrounded by low and marshy shores, and receives the Witham, Welland, Ouse, Nen, and Nar rivers. The estuary for the most part is occupied by sandbanks, dry at low water, and between these sandbanks are the channels through which those rivers flow into the North Sea. On both sides of the channel by which the Ouse falls into the sea considerable tracts of land have been reclaimed. Anchorage is afforded to vessels by two wide spaces or pools of water, called respectively Lynn Deeps, opposite the Norfolk, and Boston Deeps, off the Lincoln coast.


WASHINGTON
SCALE OF STATUTE MILES
SCALE OF KILOMETERS
County Towns
Railroads
Longitude 121° West from 120° Greenwich
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WASHBURN, GEORGE, an American educator; born in Middleboro, Mass., March 1, 1833; was graduated at Amherst College in 1855, and at Andover Theological Seminary in 1859; became Professor of Philosophy in Robert College, Constantinople, in 1868; was acting president there in 1870-1877, and became president in the latter year. He was an authority on the political questions of southeastern Europe. During the World's Parliament of Religions in Chicago, in 1893, he delivered an address on Mohammedanism. He contributed many articles to English and American periodicals. He died in 1915.

WASHBURN COLLEGE, a coeducational institution in Topeka, Kan.; founded in 1865 under the auspices of the Congregational Church; reported at the close of 1919: Professors and instructors, 40; students, 840; president, P. P. Womer, Sc. D.

WASHBURNE, ELIHU BENJAMIN, an American statesman; born in Livermore, Me., Sept. 23, 1816. He early tried journalism, but abandoned it to study law at Harvard; was admitted to the bar in 1840 and began practice in Galena, Ill. He was elected to Congress in 1852 and held office till 1869, when he was appointed Secretary of State by President Grant, and soon after minister plenipotentiary to France. During the Franco-Prussian War he made the American legation the refuge of Germans and other foreigners who could not leave Paris. For this service he received special honors from the Emperor of Germany and Bismarck, as well as from the French leaders, Gambetta and Thiers. In 1887 he published "Recollections of a Minister to France." After he returned to the United States he resided in Chicago, where he died Oct. 22, 1887.

WASHINGTON, a State in the Western Division of the North American Union; bounded by British Columbia, Idaho, Oregon, Puget Sound, and the Pacific Ocean; admitted to the Union, Nov. 11, 1889; capital, Olympia; number of counties, 38; area, 69,127 square miles; pop. (1890) 349,390; (1900) 518,103; (1910) 1,141,990; (1920) 1,356,621.

Topography.—The surface of the State is exceedingly rugged, being traversed from N. to S. by the great range of the Cascade Mountains about 100 miles from the coast. The highest peaks, all extinct volcanoes, are Mount Rainier, 14,444 feet; Mount Baker, 10,827 feet; Mount St. Helena, 9,750 feet; and Mount Adams, 9,000 feet. Eastern Washington, lying between the Cascades and the Columbia river, includes the Yakima and Kittitas valleys, and is watered by the Columbia river and its tributaries; the Yakima, Snake, Spokane, Methow, and Okanogan rivers. Lake Chelan, in the center of the State, is 70 miles in length, and 3 miles wide. Western Washington has an abrupt slope to tide water, and contains a few fertile prairies and much broken mountain land. It contains Puget Sound Basin, Shoolwater Bay, and the Lower Columbia valley. Puget Sound extends inland about 80 miles and contains many excellent harbors. The Pacific coast has numerous prominent headlands, including Capes Disappointment and Flattery. The principal rivers of western Washington are Des Chutes, Puyallup, Duwamish, White, Black, Cedar, Lummi, Skagit, Swinamish, Skokomish, and Snohomish.

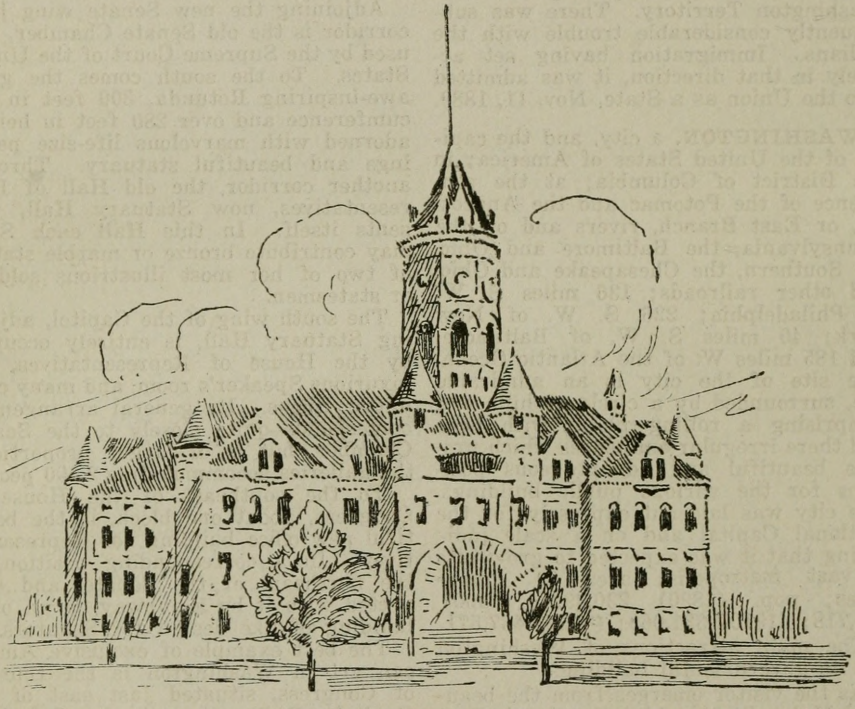
Geology.—The Cambrian, Silurian, Eozoic, Tertiary, and Cretaceous periods are all represented in the mountains of the W. portion of the State. The N. part, the Blue Mountains and the Coast Range are of the Eozoic period, and the central portion is a volcanic formation.

Mineralogy.—Washington is called the Pennsylvania of the Pacific on account of its mineral wealth, especially in coal, in the Puget Sound basin. Gold is found in the Yakima valley, and silver near Spokane. The chief mineral products are gold, silver, lead, copper and zinc. The production of coal in 1919 was 3,100,000 tons, which was 982,000 tons less than the production of the previous year. The production of copper was 2,210,350 pounds. The production of gold in 1919 was about 13,000 fine ounces, valued at $285,000. The production of silver was 316,028 fine ounces, valued at $354,220. Other important mineral products are granite, sandstone, marble and limestone, clay products, cement, antimony and tungsten. The total value of the mineral production is over $15,000,000 annually.

Agriculture.—The river valleys and plains of eastern Washington have under scientific irrigation become exceedingly fertile and productive. Stock raising and dairy farming are becoming important industries. The acreage, value and production of the principal crops, were as follows: corn, 45,000 acres, production 1,620,000 bushels, value $2,997,000; oats, 320,000 acres, production 12,800,000 bushels, value $11,904,000; barley, 138,000 acres, production 4,140,000 bushels, value $5,589,000; wheat, 2,440,000 acres, production 40,100,000 bushels, value $85,814,000; hay, 794,000 acres, production 1,906,000 tons, value $43,838,000; potatoes, 58,000 acres, production 7,250,000 bushels, value $10,512,000.

Manufactures.—There were in 1914, 3,829 manufacturing establishments in the State, employing 67,205 wage earners. The capital invested was $277,715,000; the wages paid $51,703,000; the value of the materials used $136,609,000; and the value of the finished products $245,326,000.

Banking.—On Oct. 31, 1919, there were reported 84 National banks in operation, having $13,010,000 in capital, $6,886,000 in outstanding circulation, and $42,687,000 in United States bonds. There were also 274 State banks, with $13,395,000 capital and $3,691,000 surplus. The exchange at the United States clearing house at Seattle, for the year ending Sept. 30, 1919, aggregated $2,013,736,000; an increase over those of the preceding year of $352,932,000.



STATE CAPITOL, OLYMPIA, WASHINGTON

Education.—There were in 1919: 3,439 schools, with 8,158 teachers. The attendance in the elementary schools was 235,008, and in the high schools, 37,317. There are three normal schools, with about 5,000 students. The total expenditure for the year for educational purposes was $16,587,356. The universities for higher education are the University of Washington at Seattle, University of Puget Sound at Tacoma, State College at Pullman, Gonzaga College at Spokane, and Whitman College at Walla Walla.

Finances.—The receipts for the year 1917-1918 amounted to $15,643,321, and the disbursements to $14,878,937. There was a balance on hand at the end of the year of $5,372,820. The assessed valuation of real estate in 1919 was $722,761,254, and of personal property $179,764,087. The state has no outstanding bonded debt.

Charities and Corrections.—The institutions under control of the State include school for the deaf, school for the blind at Vancouver, training school at Chehalis, school for girls at Grand Mound, Soldiers' Home at Orting, Veterans' Home at Port Orchard, three insane asylums, a penitentiary at Walla Walla, institution for feeble-minded at Medical Lake, and a reformatory at Monroe.

Churches.—The strongest denominations in the State are the Roman Catholic; Methodist Episcopal; Disciples of Christ; Regular Baptist; Presbyterian; Congregational; Protestant Episcopal; Lutheran; Independent Synods; and United Brethren.

Railways.—The railway mileage in

the State in 1919, was 6,292.09. The roads having the longest mileage are the Northern Pacific, the Great Northern, and the Oregon and Washington.

State Government.—The governor is elected for a term of four years. Legislative sessions are held biennially and are limited in length to 60 days each. The Legislature has 41 members in the Senate and 97 in the House. There are five Representatives in Congress.

History.—For the early history of this region, see OREGON. Washington was a part of Oregon Territory till the admission of Oregon, in 1853, when this section was separately organized as Washington Territory. There was subsequently considerable trouble with the Indians. Immigration having set actively in that direction, it was admitted into the Union as a State, Nov. 11, 1889.

WASHINGTON, a city, and the capital of the United States of America; in the District of Columbia; at the confluence of the Potomac and the Anacostia, or East Branch, rivers and on the Pennsylvania, the Baltimore and Ohio, the Southern, the Chesapeake and Ohio, and other railroads; 136 miles S. W. of Philadelphia; 226 S. W. of New York; 40 miles S. W. of Baltimore, and 185 miles W. of the Atlantic Ocean. The site of the city is an admirable one, surrounded by a circle of hills and comprising a rolling plain, with here and there irregular eminences which provide beautiful and advantageous positions for the various public buildings. The city was laid out expressly for the National Capital and on a scale indicating that it was expected to grow into a vast metropolis; area 69 square miles; pop. (1890) 230,392; (1900) 278,718; (1910) 331,069; (1920) 437,571.

The main attractions of Washington are its governmental buildings.

As the visitor emerges from the beautiful Union Station his attention is first directed to the United States Capitol, but a few blocks to the south. This massive range of buildings on Capitol Hill, including the Senate Chamber, House of Representatives, Supreme Court, Statuary Hall and the Dome covers nearly four acres. Its cost, including the land, was about $16,000,000 and was seventy-four years in process of construction. The great cast iron dome, weighing 4,500 tons and costing $1,000,000, required eight years in its construction. The bronze statue of Armed Liberty, surmounting the Dome, is 19 feet 6 inches high and cost over $24,000.

To the north, nearest Union Station, is the Senate wing of the Capitol. The Senate Chamber is located in the center of this building. The cast iron ceiling, paneled with stained glass, bears the coat of arms of each State. A gallery surrounding the hall accommodates a thousand persons. Here are located the reporters, diplomatic corps, and Senators' families, private galleries. The Senators' desks are arranged in semi-circular rows, the Democrats sitting on the right and the Republicans on the left of the Vice-President, who presides. The President's room, that of the Vice-President, and the Marble room are opposite the corridor from the Senate Chamber.

Adjoining the new Senate wing by a corridor is the old Senate Chamber, now used by the Supreme Court of the United States. To the south comes the great awe-inspiring Rotunda, 300 feet in circumference and over 280 feet in height, adorned with marvelous life-size paintings and beautiful statuary. Through another corridor, the old Hall of Representatives, now Statuary Hall, presents itself. In this Hall each State may contribute bronze or marble statues of two of her most illustrious soldiers or statesmen.

The south wing of the Capitol, adjoining Statuary Hall, is entirely occupied by the House of Representatives, the luxurious Speaker's room, and many committee rooms. Its general arrangement corresponds quite closely to the Senate Chamber, but is of larger proportions, the galleries accommodating 2,000 people.

To the southeast of the House of Congress, about one block, is the beautiful new office building for Representatives. In a corresponding position, to the northeast of the Senate, and connected with it by a subway, is an office building of like design for Senators.

The best example of exclusive American art in Washington is the Library of Congress, situated just east of the Capitol. Built primarily for Congressmen, this great storehouse of valuable books and works of art is used more freely by the people than any library in the world. Its interior is the most inspiring and marvelous combination of gold, silver, rare marbles and mosaic on such a gigantic scale to be found in America.

The Treasury building, just east of the White House, is in every way the most substantially built government building. It is 450 feet long, 250 feet wide and was completed in 1867, at a cost of $7,000,000. When built it was thought ample for all times, but even to-day it will hardly accommodate one-half of the Treasury employes. From a small be-

ginning in 1776, when the Continental Congress appointed two Joint-Treasurers of the United Colonies, each at a salary the first year of $500, has grown this present wonderful financial organization, the solidity of which sustains our pre-eminence as the greatest world power.

An important adjunct to, and under the direction of, the Treasury, is the Bureau of Engraving and Printing. The new building, just completed, is the finest workshop in the world. The great care exercised in preventing counterfeiting and theft is a long story in itself. Over $1,000,000 of paper money is turned out every working day from this establishment.

The Patent Office, a very important branch under the Interior Department, is one of the oldest government buildings in Washington. Its Doric architecture gives it a strong, yet simple appearance. Since the days of Thomas Jefferson, when he conducted the duties of State and also Patent Examiner, this very important department has grown to over 1,000 employes and more than 500 patents are granted each week. The Patent Office is the only self-supporting bureau of the Government.

The Pension Office is reputed to be the largest brick building under one roof. A distinctive feature which encircles the building is the terra-cotta frieze over the first story window, portraying a spirited procession of soldiers, infantry, cavalry and artillery. Its interior consists of an immense court broken by two rows of columns which support the great roof. Galleries lead from the court to numerous offices. The Grand Inaugural Ball for years was held in this building where fully 18,000 people have assembled.

The Municipal building, constructed of Vermont white marble at a cost of $2,000,000, is an excellent example of the present-day tendency to produce public buildings of the greatest beauty. It contains the offices of the District Commissioners and all municipal departments except the courts. Washingtonians have no vote, therefore the three Commissioners are appointed by the President and confirmed by the Senate.

The new City Post Office adjoining Union Station is the most recent addition to Washington's beautiful buildings. Of Woodbury granite, its construction cost totals about $3,000,000. It is the most modern Post Office in the world.

Another distinctive Washington building is the new railway terminal, Union Station. It affords the most fitting and dignified entrance to the National Capital. The terminal improvements and construction of building cost nearly $20,000,000. The railroads from the South enter the station through the twin tunnels running through Capitol Hill.

The Pan-American building is considered by many the most beautiful in America. Its wonderful glass-covered court, 60 feet square, the sunken gardens, beautiful statuary and artistic grounds are the admiration of everyone. The building is conducted by the twenty-one Republics of North, South and Central America for the development of Pan-American commerce and friendship. Its construction cost was $1,000,000, one-fourth being paid by the American Republics and three-fourths by Mr. Andrew Carnegie.

Memorial Continental Hall, erected by the National Society Daughters of the American Revolution, is an exquisite example of Colonial architecture. The beautiful south portico is unique by reason of the thirteen solid marble columns, a gift from the States forming the original thirteen Colonies. Its beautiful Vermont white marble construction presents a most imposing appearance. The National Societies each year in April hold a convention in this Hall, over 2,000 delegates attending.

The famous Corcoran Gallery of Art was founded and endowed by the late William W. Corcoran in 1869, a gift to the people. Below the elaborately carved cornice runs a frieze bearing the names of eleven famous sculptors and painters. Original marbles, bronzes, rare paintings by the most celebrated artists, and casts and replicas from the finest specimens of antique and modern sculpture, fill the rooms and line the corridors. On Tuesdays, Thursdays, Saturdays, Sundays and holidays, the admission is free; at other times 25 cents is charged.

The Lincoln Memorial, in 1921 under construction in Potomac Park, at the axis of the Capitol and Washington Monument, is a stupendous undertaking. Its construction is of Colorado white Yule marble and is to cost $2,000,000. Its height will be 123 feet from the Park level, the length 204 feet and depth 134 feet. The central hall will be 60 feet high, 70 feet long and 60 feet wide and will contain a large statue of the martyred President.

Two conspicuous landmarks seen upon the hills surrounding Washington are the Lee Mansion, at Arlington, Va., on the west, and the Soldiers' Home, to the north.

Arlington, the former home of Gen. Robert E. Lee, was built by George Washington Parke Custis, grandson of Martha Washington and father of Mrs.

Robert E. Lee, in 1802. After General Lee left to join the Confederate Army, the estate was used by the Federal Government for a camp, hospital ground, and later as a National Cemetery. In one grave are 2,111 unknown soldiers who fell in the great civil conflict.

The Fort Myer Reservation, adjoining Arlington Cemetery, contains much of interest.

The Soldiers' Home, a beautiful stretch of rolling country, comprising 512 acres, consists of five dormitories with every modern convenience, a hospital, chapel, library, and various other buildings. Soldiers who have been honorably discharged after twenty years' service, or have become disabled, are eligible to the Home.

The immense granite State, War and Navy building covers four and one-half acres and contains 500 rooms with two miles of marble corridors. It was completed in 1893 at a cost of $11,000,000. A beautiful new building on New York Avenue for the Navy and several others for the War Department are also occupied.

The Department of State guards the original Declaration of Independence and the Constitution of the United States in its fire-proof vaults. The sword of Washington, a staff belonging to Franklin, the original Great Seal of the United States, and many other relics are on exhibit.

The War Department contains models of the Army uniforms at various periods of the service.

At the several entrances to the Navy Department are numerous cannon and mortars captured in our several wars. The corridors contain many models of battleships and cruisers. At the Navy Yard on the Eastern Branch, a tributary of the Potomac river, is located the Barracks, the home of the famous United States Marine Band.

The origin of the Smithsonian Institution was as strange as it has been beneficial. The donor, an Englishman with the assumed name of Smithson, bequeathed his fortune of over $500,000 "for the establishment of an institution in Washington for the diffusion of knowledge among men." Congress granted fifty acres in 1846 on which the buildings were to be erected. Under the skillful direction of its first secretary, Joseph Henry, the institution was established on a very wise and solid basis. The new and old National Museums and the Zoölogical Park come under its jurisdiction.

The Zoölogical Park, located in Rock Creek Valley, comprises 167 acres of picturesque country. It contains about 1,400 animals from all parts of the world. It is open until 6 p. m. every day.

The new National Museum, located on the Smithsonian grounds, is one of the leading attractions of the Capital. Its many million specimens of curios, relics, minerals, mounted animals and birds would take years to study carefully.

The greatest business organization of the United States is the Post Office Department. Now more business is transacted each day than was handled in a year a century ago. Since this building was completed in 1899 until 1914, when removed to its new location, the Washington City Post Office occupied the first floor. The advent of the Parcel Post now taxes this immense nine story building to its capacity. The Dead Letter Office at the National Museum offers much of interest.

There were in 1919 14 National banks, with a capital of $7,427,000; an outstanding circulation of $5,715,000; a surplus of $5,368,000; and United States bonds valued at $20,415,000. The total exchanges at the clearing house for the year ending Sept. 30, 1919, amounted to $791,804,000, an increase of $120,858,000 over the preceding year. The assessed property value of real estate in 1919 was $414,610,691, and of personal property $37,092,897. The tax rate was $15 per thousand. The net public debt of the city was $3,823,869. There were enrolled in the public schols 60,284 pupils, with 1,831 teachers. The annual cost of maintaining public schools is about $3,000,000 annually. There were in 1919 638 miles of street, of which 515 are paved. The total miles of sewer were 730. There were in 1914 268 manufacturing establishments owned by individuals and 153 by corporations. The total value of the manufactured product was about $30,000,000.

History.—In 1663, Francis Pope, an Englishman, purchased the original site of Washington from the Indians, and named it Rome. The hill on which the Capitol now stands he called Capitoline Hill, and the Anacostia or East Branch river the Tiber. In 1789-1790, several States made efforts to secure the seat of government. A tract of land, 10 miles square was offered by Maryland and Virginia, and was accepted as a compromise in 1790, with the understanding that Philadelphia should be made the capital till 1800, when it was expected the new city would be ready for occupation. The site was first named the Territory of Columbia, but was afterward changed to the Federal District of Co-

lumbia. On March 30, 1791, an act was passed to fix the boundaries of the city and to locate the public squares and buildings. Washington himself determined these points, which were then laid out by Andrew Ellicott. On April 15, 1793, the corner stone of the Capitol was laid. It appears to have been the wish of President Washington that the city should be named the "Federal City," but the present name was adopted in his honor, Sept. 9, 1791. The city was incorporated May 3, 1802. The English captured it Aug. 24, 1814, and burned the Capitol and other public buildings. In 1871 the municipal government of the city was abolished, Georgetown was consolidated with it and a territorial government established for the District of Columbia. But in 1874 Congress changed the government and placed it under control of three commissioners, abolishing the suffrage. In 1878 the government by commissioners was made permanent in the act of June 11, 1878, termed by the United States Supreme Court, the "Constitution of the United States." The city of Washington has had no government of its own. During the Civil War Washington was the scene of great military operations. It was fortified by a cordon of 68 massive earthworks or forts shortly after the beginning of the war. These works extended over a perimeter of 14 miles.

WASHINGTON, a city of Indiana, the county-seat of Daviess co. It is on the Evansville and Indianapolis, and the Baltimore and Ohio Southwestern railroads. Its industries include the manufacture of lumber, flour, plows, etc. It has the Baltimore and Ohio Southwestern railroad shops. Pop. (1910) 7,854; (1920) 8,743.

WASHINGTON, a borough and county-seat of Washington co., Pa.; on Chartiers creek, and on the Waynesboro and Washington, the Pennsylvania, the Pittsburgh, Cincinnati, Chicago and St. Louis, and the Baltimore and Ohio railroads; 31 miles S. W. of Pittsburgh. It contains WASHINGTON AND JEFFERSON COLLEGE (*q. v.*), the Lemoyne Cremation plant, numerous churches, court house, public library, National and private banks, and several daily and weekly newspapers. It has carriage shops, broom factory, cigar factories, stove foundries, tanneries, woolen and flour mills, etc. Pop. (1910) 18,778; (1920) 21,480.

WASHINGTON, UNIVERSITY OF, a coeducational non-sectarian institution in Seattle, Wash.; founded in 1861; reported at the close of 1919: Professors and instructors, 210; students, 2,457; president, H. Suzzallo, Ph. D.

WASHINGTON, BOOKER TALIAFERRO, an American educator; born a slave in Hale's Ford, Va., about 1859. After the Civil War he removed with his mother to West Virginia, where he worked in the mines, attending school in the winter. In 1875 he was graduated with honors at the Hampton Institute, Va.; was a teacher there till in 1881, when he was elected by the State authorities of Alabama principal of the Tuskegee Normal and Industrial Institute, which he organized and built up. He received the degree of A. M. from Harvard University in 1896; was a speaker on educational and racial subjects, and wrote: "Sowing and Reaping" (1900); "Up From Slavery" (1901); "The Negro in Business" (1907); "The Story of the Negro" (1909); "The Man Farthest Down" (1912). He died in 1915.

WASHINGTON, BUSHROD, an American jurist; born in Westmoreland co., Va., in 1762; was nephew of George Washington, and became heir to his papers and library; was a member of the Virginia House of Delegates, and of the Virginia ratifying convention in 1788; associate justice of the United States Supreme Court in 1798-1829. He took great interest in the organization of the American Colonization Society, and was appointed its first president. He died in Philadelphia, Pa., in 1829. His nephew, AUGUSTINE WASHINGTON, came into possession of the Washington residence, at Mount Vernon, and died in 1832. He was the author of "Reports of the Court of Appeals of Virginia."

WASHINGTON, GEORGE, an American statesman, military officer, and 1st President of the United States; born of English stock in Westmoreland co., Va., Feb. 22, 1732. His father died early, but his mother, Mary Ball, gave him an admirable training, which was continued later by his elder half-brother, Augustine. Of actual schooling he had little, save such as sufficed to make him a practical surveyor. He spelt badly, but was able to do accounts well; he wrote poor verses, but was careful to copy out 50 odd "rules of behavior"; he had as little of the true literary afflatus as any youth of genius could well have, but he tamed the wildest horses and dominated the most unruly of his schoolmates. In short, he was a young Virginian Cyrus, riding well, shooting well, and telling the truth. But if it was fortunate for his country that he escaped becoming an epic poet, it was equally fortunate that he gave up the idea of entering the English service as a midshipman on account of a dutiful

regard for his mother's wishes. One can contemplate with pleasure the picture he presents as a 16-year-old explorer, surveying the lands of Lord Fairfax amid the wild passes of the Alleghenies. The youth who so bravely fronted all "moving accidents by flood and field," who gained a reputation for sobriety and prudence both with the savage tribes he was forced to encounter and the official circles of Williamsburg, was doing precisely the work best fitted to prepare him for the higher labors of his manhood.

He rose rapidly, and in three years was made adjutant-general of militia in one of the border districts. But he was soon called away to accompany his invalid brother Lawrence on a voyage to the West Indies. This was destined to be his only experience of foreign travel; but he was by nature little capable of being tainted by provincialism. Returning to Virginia, he found his military charge renewed, and was given speedy opportunity for active service. He was dispatched by Governor Dinwiddie in the fall of 1753 on a mission to the French invaders of the Ohio region—a dangerous task, which others had declined, but which he accepted with alacrity. He braved the rigor of the season and the peril of the long and almost unknown way, and in about three months' time was back at Williamsburg with the French answer. Neither savages nor treacherous guides, nor ice-gorged rivers could prevail against so bold a heart or so keen an eye; nor could flattery at home undermine a nature so well balanced, a modesty so innate and pure. He was at once put in command of the temporary militia of the colony, and was subsequently made lieutenant-colonel of the augmented forces. His superior officer soon died, however, and he was left in full charge of the expedition to the Ohio. He acquitted himself admirably in the fight at Great Meadows, but was forced to capitulate shortly after, the result being honorable, and on the whole fortunate, considering the rashness of the enterprise.

The death of the French officer Jumonville in a preliminary skirmish led to a curious sort of reputation for the young colonial soldier, the future liberator of America being denounced as an assassin because of an absurd mistake by which the leader of a scouting party was converted into the bearer of a flag of truce. But while French censure could not hurt Washington, Dinwiddie's conduct with regard to the reorganization of the Virginian troops did; and after a manly remonstrance he resigned, showing in this matter, as well as in his subsequent refusal to submit to be outranked by officers holding royal commissions, that perfectly poised dignity of character for which he is probably more noted than any other great man in history. When Braddock, however, offered Washington a post as aide-de-camp which he could accept with honor, he was glad enough to march against the foe and to tender advice which no man in America was better fitted to give and no commanding officer less likely to profit by. The prudence of Washington as a counselor, as well as his intrepid conduct at Fort Duquesne, taught all discerning observers that he had in him the stuff of which not only good border soldiers but also great generals are made; and one of these observers, the eloquent preacher, Samuel Davies, was wise enough to predict that "that heroic youth, Colonel Washington," would one day render his country some distinguished service. For a time his services were chiefly directed toward securing the safety of the Virginia borders, and he found leisure to make a visit to Boston on military business, as well as to fall in love.

His marriage with the widow, Martha Custis, took place in January, 1759, and those who are wont to accuse Washington of lacking sentiment may be advised to study carefully all that can be learned about the romantic affair. Military life seemed over for him, and he settled down as a gentleman farmer, serving his colony in the House of Burgesses, where he was formally thanked for his exertions in the public behalf, but was too modest to be able to reply; looking after the interests of his parishes in the local vestries, dispensing hospitality in true Virginian style, and superintending his estates in a thrifty fashion peculiarly his own; and last, but not least, keeping up his spirits and his health by frequent indulgence in the manly sport of fox hunting. At the age of 30 he was plainly the greatest soldier in the colonies, the man to whom all eyes would turn should any public danger impend; and if no danger came, he would nevertheless be one of the wealthiest and most prominent citizens of the "Ancient Dominion." He had thus little to wish for except children. But if children did not come, his wife was destined to be filled with a higher love and more absorbing cares. He was to be the Father of his Country. From his seat at Mount Vernon, which he had been progressive enough to link with the rest of the world by a private wharf, he watched the clouds gathering in the political heavens, and he showed a statesmanly prescience in being almost the first American to perceive that a complete break with England was

necessary to the peace and prosperity of the colonies.

He was no revolutionist, but neither was he afraid to trust the conclusions of his own mind; and if he was no orator, he was at least not the man to mince his words. Cæsar himself did not more thoroughly see the necessity for one-man rule at Rome than Washington saw the necessity for public independence in America. He declared at Williamsburg, in 1774, that he was ready to raise 1,000 men, support them at his own expense, and march them to the relief of Boston. A few weeks later he rode on horseback with Patrick Henry and Edmund Pendleton to attend the 1st Continental Congress in Philadelphia. He was, by the confession of Henry himself, easily the greatest man among the delegates. The 2d Congress saw him again in attendance, and ready to give his life for his country. But though he could brave death he could not face praise, and he left the chamber when John Adams nominated him to Commander-in-Chief of the Continental forces. The next day he accepted the post, while protesting his own unworthiness and refusing to accept any pay beyond a reimbursement of his expenses. No Roman of old ever came forward to save the State with purer intentions or with more favorable auguries of success. Though to weaker spirits the prospect was appalling, strong men drew happy omens, not from the flight of birds and the entrails of victims, but from the justice of the common cause and the character of Washington. Nor did they mistake, nor do we now mistake, when we assign the success of the Revolution to these two causes.

As one traces the weary years that elapsed between his taking command (July 3, 1775) and his laying down his office (Dec. 23, 1783), it is perceived clearly that under Providence the issue of the mighty struggle depended on him. Had he lost heart at the supineness and bickerings of the people at large, had he grown weary of correcting the blunders of incapable subordinates, had he disdained to control a fatuous Congress, or to put down a wretched cabal among his own officers, had his nerves given way at the sight of the sufferings at Valley Forge, had his spirit wavered at frequent defeat—in short, had he been anything but the noble patriot and great commander that he was, the course of history might have been changed, and the United States might have died in its birth and forever, or come into existence again years later and under far different auspices. But he was Washington—the noblest figure that any people has ever set in the forefront of its life and history. While he lived and fought on with his ragged troops, the Union was maintained in spite of all State squabbles; while he was in command, any alliance made with France must be one which America could accept with dignity; while his brave heart beat, repulse meant only fresh resolve, and hardship and suffering only more splendid rewards of triumph.

It is idle to deny that he was the soul of the Revolution, and it is equally idle to ask whether or not he was a great general. Whether he was, technically speaking, a master of the art of war, students of that art may decide; though it is as well to remind them that Frederick the Great praised his Trenton campaign as a masterpiece of strategy. But that he is worthy to rank with the supreme commanders of history, no man of sound judgment and capable imagination will deny. Not that he always won his battles, or won them in the most approved way; not that he flamed like a comet in the heavens, threatening desolation to the nations; not that he moved across the world's stage like a Karl or a Timor. His career does not enthrall us as does that of Alexander; it has not such tragic elements of inspiration and pathos as has that of Hannibal; it does not leave us breathless with admiration as does that of Cæsar; it does not exalt us and horrify us as does that of Napoleon. But it does give us that supreme sense of satisfaction which flows from the perception of harmony and proportion; it does thrill us with the intense and elevated joy which must ever follow the spectacle of great powers consciously working for the successful accomplishment of divine justice; it does fascinate us by means of those elements of sublimity and pathos that are never absent from the contemplation of a lonely but serene elevation above the common tide of humanity.

Nor are concrete evidences of his greatness as a soldier lacking. We remember the Berserker rashness and daring displayed at Fort Duquesne and at Monmouth, and we recall William the Conqueror at Hastings. We watch him at the crossing of the Delaware and at Valley Forge, and we recall Hannibal on the Alps. We observe him turning a ragged body of suspicious New Englanders into trained soldiers ready to die for him, and we recall no less a man than Cæsar. We see him put down the Conway cabal and reduce Congress to his bidding, and we recall Marlborough. We see him quell Lee with his fiery eye and biting words, and we somehow recall Cromwell. We watch him in his tent, brooding over the treason of Arnold and

weighing the claims of mercy and justice in the case of André, and we recall only his own imperial self. Yes, Washington the general is a supremely great man, and those who deny the fact do so because they have not been able to survey his career from the proper point of view. It is hardly an exaggeration to say that to the trained student his greatness is even implicit in his proclamations to his soldiers from first to last.

He was no master of style, but certainly for directness and vigor of phrase, for patriotic purpose, for clear-sighted content, his circular letter to the governors of all the States (June 8, 1783) is unsurpassed among the political documents of the world. His entire correspondence from the time he retired from command of the army till he re-entered the service of his country as its first President, is a monument to his modesty, his magnanimity, his prudence, and his wisdom. Frederick the Great himself, resting from war that he might restore order and peace to the people, is no grander figure than this victorious American general, watching from Mount Vernon the fortunes of his country, and lending the weight of his counsel and his example to the sacred cause of union. He served this cause still further by presiding over the convention in 1787, and 1789 he entered on the presidency of the nation, assuming a new rôle for which he was admirably fitted and in which he was destined to achieve magnificent success.

To many persons Washington the statesman is harder to realize than Washington the general. This is probably a result of political partisanship. Men look back to those two great founders of parties, Jefferson and Hamilton, and forget the chief who dominated and controlled them. Washington really made Hamilton and he always used Jefferson when he needed him; it was thus perhaps in accordance with weak human nature that Hamilton should have been ungrateful to his memory, while Jefferson was impelled to pay him a tribute—noble in spite of its jealous touches. No fact in history is more clearly established than that Washington was the chief figure in his own administrations. He came to the chair of State with the best equipment possible, and he would have left it vacant forever had it been requisite to fill it with a successor who should be his equal. He had not the analytic mind of Hamilton nor the philosophic grasp of Jefferson, but his training for the duties of a statesman had been superior to theirs. He came of a race used to act and to command. From an early age he had to rely on himself, and so he attained to that self-discipline which is indispensable to a political leader. Circumstances determined that he should learn the lessons of life from men rather than from books; thus he stood in no danger of becoming a doctrinaire. His early experiences as a surveyor, a backwoodsman, and a soldier gave him a true sympathy with democracy, and hence enabled him to understand the only rational principle on which a stable government could be founded in America; while his good birth and training, and his position as a planter aristocrat, put him in touch with that English past from which it would have been impossible for the new nation to break entirely. Add to all this the fact that his nature was essentially straightforward and manly, and that he had not a conspicuous weakness, that his mind was clear and flexible, and if not quick, certainly not slow, and we surely have as well-equipped a statesman as the world's history can furnish.

Compared with him, how the other figures of the period, even the greatest, shrink and diminish! The spiritual dignity of his altruism sits not on Franklin; his breadth and catholic charity of judgment belong neither to Hamilton nor to Jefferson: and who would think of comparing with him the Madisons, the Jays, the Morrises, the Ameses, the Wilsons of the time, able and patriotic men though they all were. Dignity, steadfastness, uprightness, serenity, benignity, wisdom—these are the characteristics of Washington's statesmanship, whether we regard his firm policy of resistance to the insolence of revolutionary France, or his refusal to plunge his country into a second war with England, or his cordial acceptance of the financial measures of Hamilton, or his steady accentuation of the national principle, or his noble efforts to reconcile his cabinet, or his strong but humane policy toward the Indians, or his prompt crushing of the Whisky Rebellion, or finally, his progressive views on the subjects of slavery and national education, and his prophetic comprehension of the importance of the West. A perfect equipoise of powers, which taken separately would not be supreme, appears to be the characteristic mark of his rare variety of genius, which among men of action is illustrated in Alfred the Great, and among men of letters in Sophocles. It is to this class that Washington belongs—to the class of men whose balance of faculties is so serenely perfect as to constitute genius of perhaps the highest order. What shall we say of such a man, save that he was as great in peace as he was in war; that he was veritably the Father of his Country?

Washington became Commander-in-Chief of the American army on June 15, 1775, and for several years his history was that of the Revolutionary War, elsewhere recorded. Suffice it here to say that he created the American army; fought the English generals, Howe, Clinton, Burgoyne, and Cornwallis, with various results; till, finally, he surrounded Cornwallis at Yorktown, and compelled him to capitulate. To his intrepidity, prudence, and moderation the United States is almost wholly indebted for the independence which was secured to it by the treaty of peace concluded in 1783. Soone after this event Washington resigned his commission to Congress, and in his address on that occasion the magnanimity of the hero was blended with the wisdom of the philosopher. He returned to his seat at Mount Vernon and, like Cincinnatus of old, he returned to his former and favorite pursuit of agriculture. The federation of the States having failed to afford an efficient government, Washington proposed conventions for commercial purposes, which led to the Convention of 1787, of which he was a member, which founded the present Federal Constitution, considered by him as the only security against anarchy and civil war. Under this Constitution he was chosen President, and inaugurated in New York, April 30, 1789. His government was marked by that well-tempered prudence which distinguished all his conduct. Having been re-elected as president, he held office till 1797, when he again retired to his estate at Mount Vernon. In 1797, when there arose a difficulty with France, threatening hostilities, he was appointed Lieutenant-General and Commander-in-Chief, a post which he accepted with extreme reluctance, but with that spirit of obedience to the call of duty which has been the governing rule of his life. On Dec. 12, 1799, he was exposed in the saddle, for several hours, to cold and snow, and attacked with acute laryngitis, for which he was repeatedly and largely bled, but sank rapidly, and died, Dec. 14.

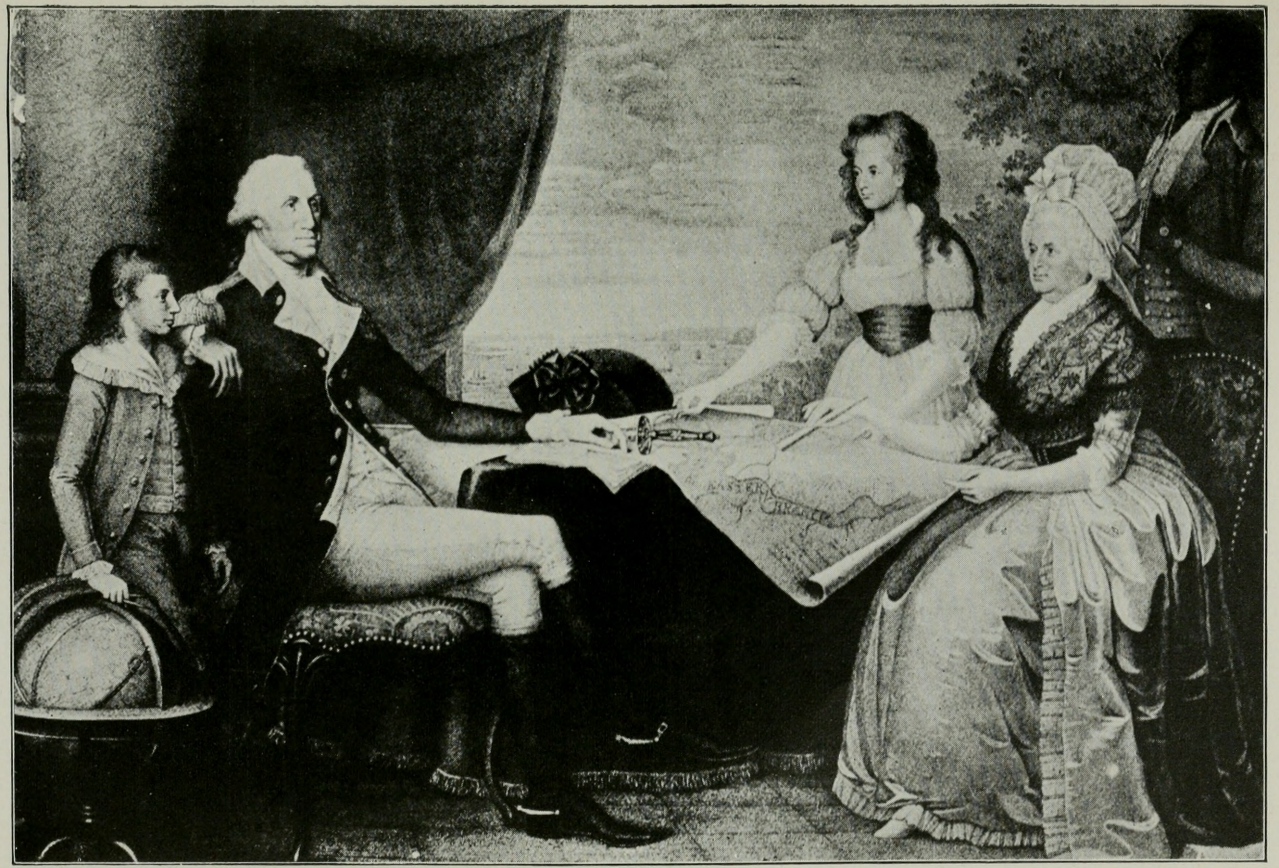
Washington was childless, but most happy in his domestic relations. He was mourned even by his enemies and deserved the record: "First in peace, first in war, and first in the hearts of his countrymen." The following estimate of the character and intellect of the great American patriot is from President Jefferson:

"His mind was great and powerful, without being of the very first order; his penetration strong, though not so acute as that of a Newton, Bacon, or Locke; and, as far as he saw, no judgment was ever sounder. It was slow in operation, being little aided by invention or imagination, but sure in conclusion. Hence the common remark of his officers of the advantages he derived from councils of war, where, hearing all suggestions, he selected whatever was best; and certainly no general ever planned his battles more judiciously; but, if deranged during the course of action, if any member of his plan was disarranged by sudden circumstances, he was slow in readjustment. The consequence was that he often failed in the field, but rarely against an enemy in station, as at Boston and York. He was incapable of fear, meeting personal danger with the calmest concern. Perhaps the strongest feature in his character was prudence, never acting until every circumstance, every consideration, was maturely weighed; refraining, if he saw a doubt; but, when once decided, going through with his purpose, whatever obstacles opposed. His integrity was the most pure, his justice the most inflexible, I have ever known; no motives of interest or consanguinity, of friendship or hatred, being able to bias his decision. He was, indeed, in every sense of the word, a wise, a good, and a great man. His temper was naturally irritable and high-toned; but reflection and resolution had obtained a firm and habitual ascendency over it * * * * His person was fine, his stature exactly what one could wish. Though in the circle of his friends, where he might be unreserved with safety, he took a free share in conversation, his colloquial talents were not above mediocrity, possessing neither copiousness of ideas nor fluency of words. In public, when called on for a sudden opinion, he was unready, short, and embarrassed. Yet he wrote readily, rather diffusely, in an easy and correct style. He read little, and that only on subjects of agriculture and English history."

WASHINGTON, FORT, a Revolutionary fortress on Manhattan Island (New York City), captured by the British in 1776.

WASHINGTON, TREATY OF, a treaty between Great Britain and the United States, signed May 8, 1871. Under its terms the "Alabama" claims, the San Juan boundaries, and certain fisheries disputes were settled by arbitration.

WASHINGTON AND JEFFERSON COLLEGE, an educational institution in Washington, Pa.; founded in 1802, under the auspices of the Presbyterian Church; reported at the close of 1919: Professors and instructors, 18; students, 290. President, S. C. Black, LL. D.



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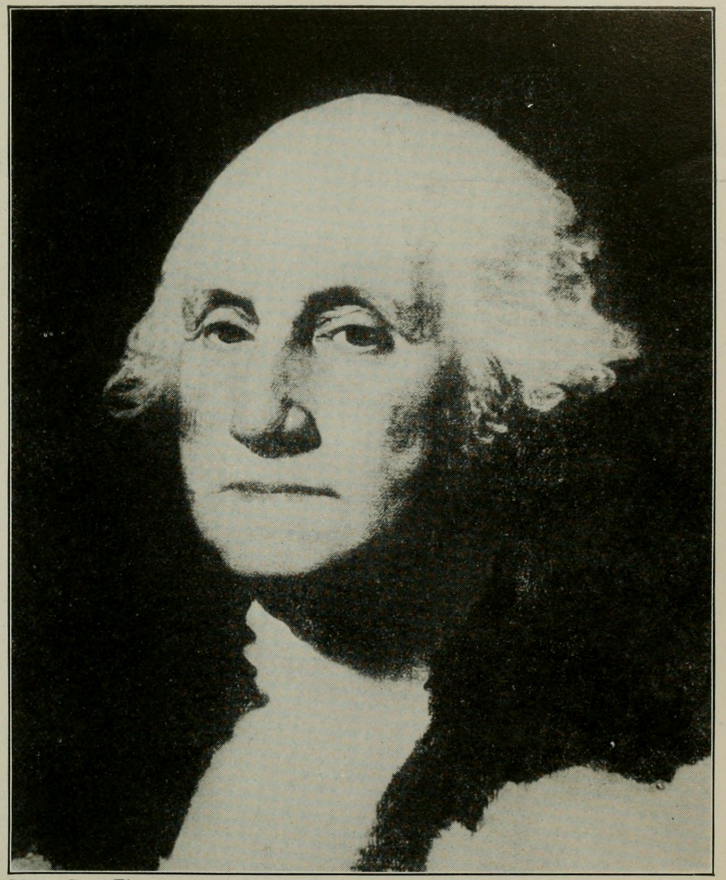
WASHINGTON, MRS. WASHINGTON, AND HER CHILDREN AT MT. VERNON. A REPRODUCTION OF THE PAINTING BY EDWARD SAVAGE

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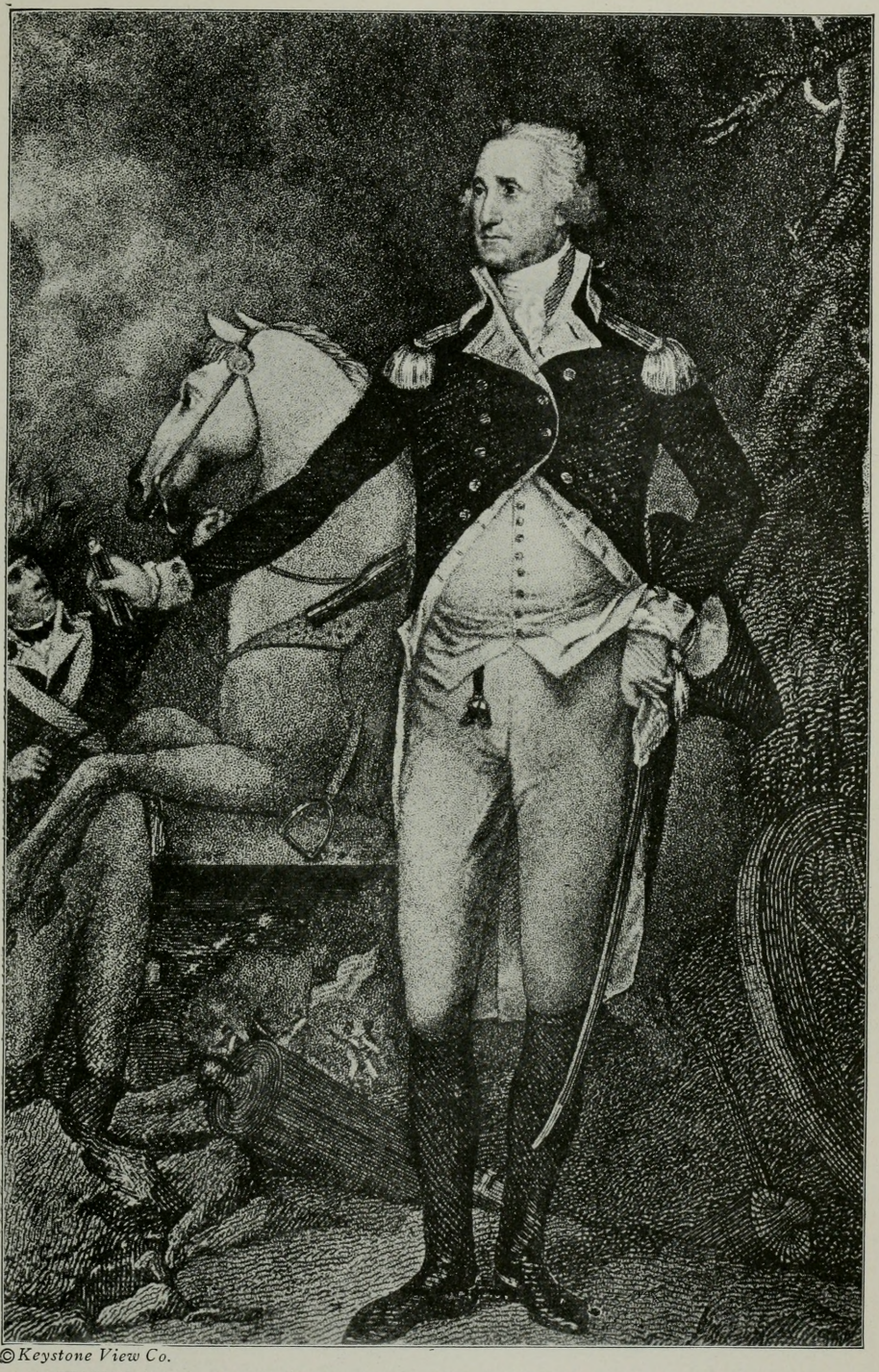
Photo, Paul Thompson

MARTHA WASHINGTON, FROM THE PAINTING BY GILBERT STUART



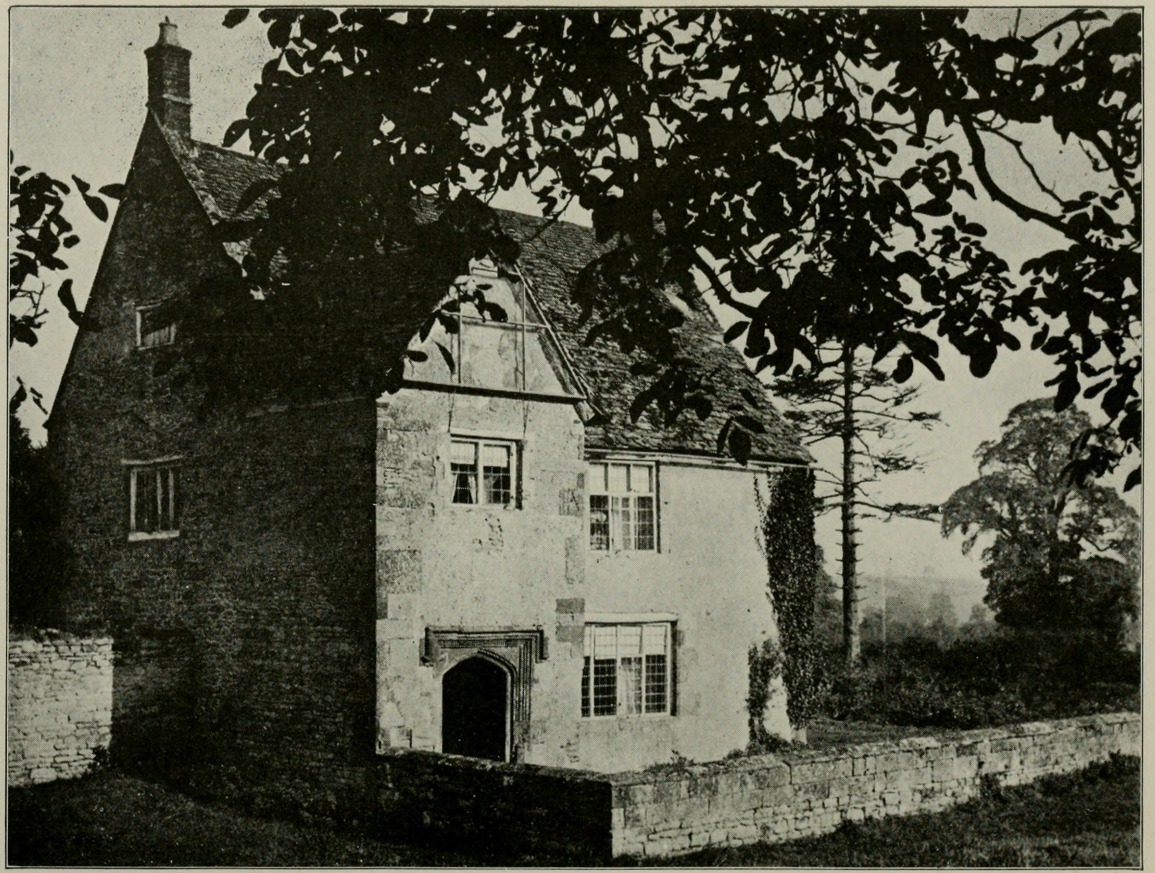
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GEORGE WASHINGTON, FROM THE PAINTING BY GILBERT STUART



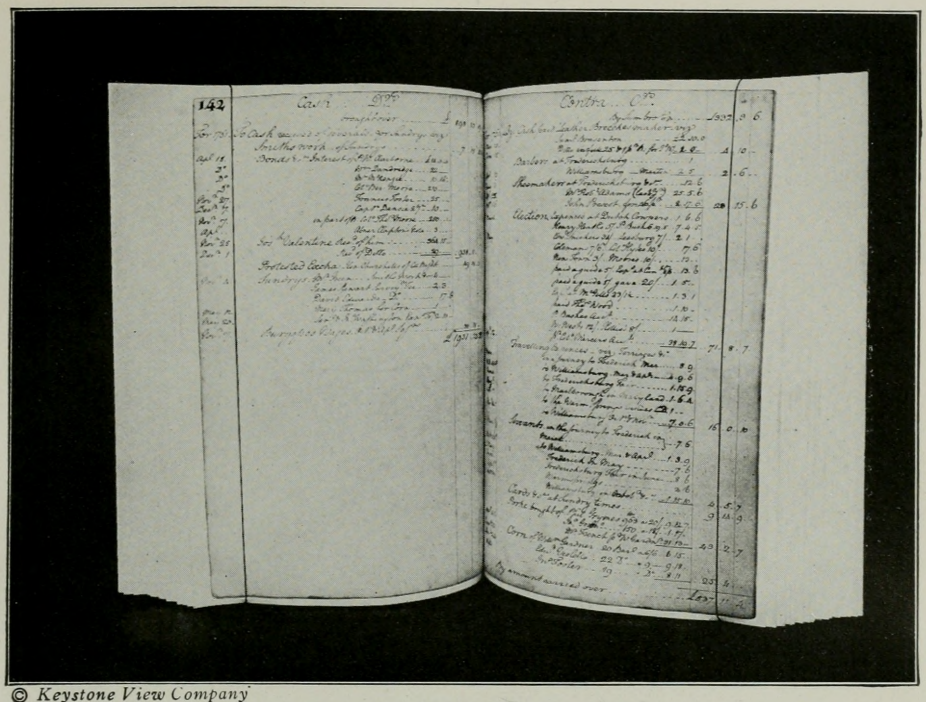
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WASHINGTON AT TRENTON. FROM THE PAINTING MADE BY TRUMBULL



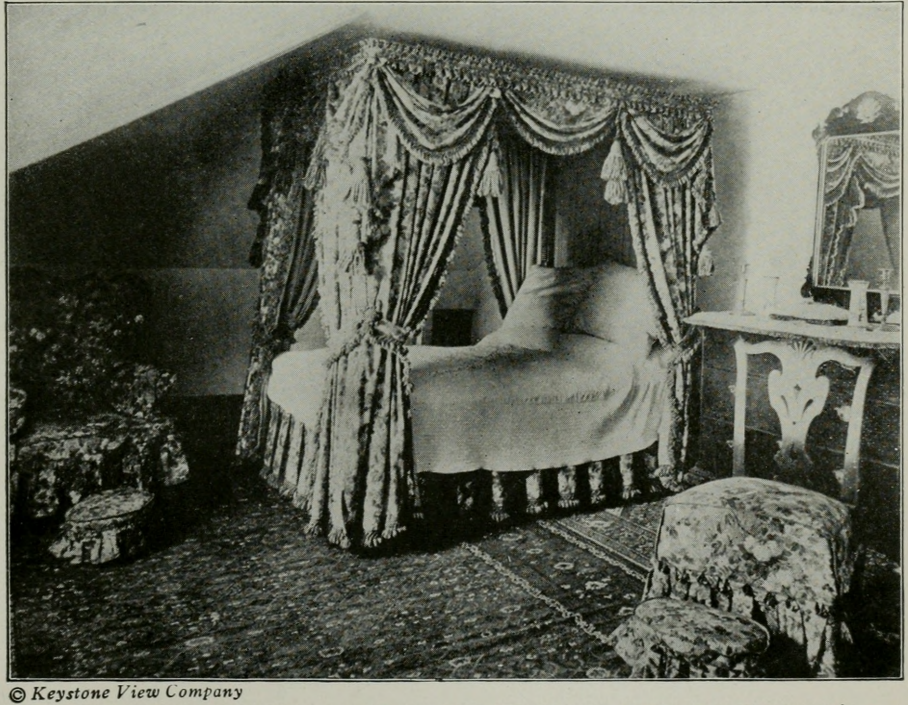
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SULGRAVE MANOR, ANCESTRAL HOME OF THE WASHINGTON FAMILY



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PAGES OF THE CASH BOOK WASHINGTON KEPT IN HIS OWN HAND



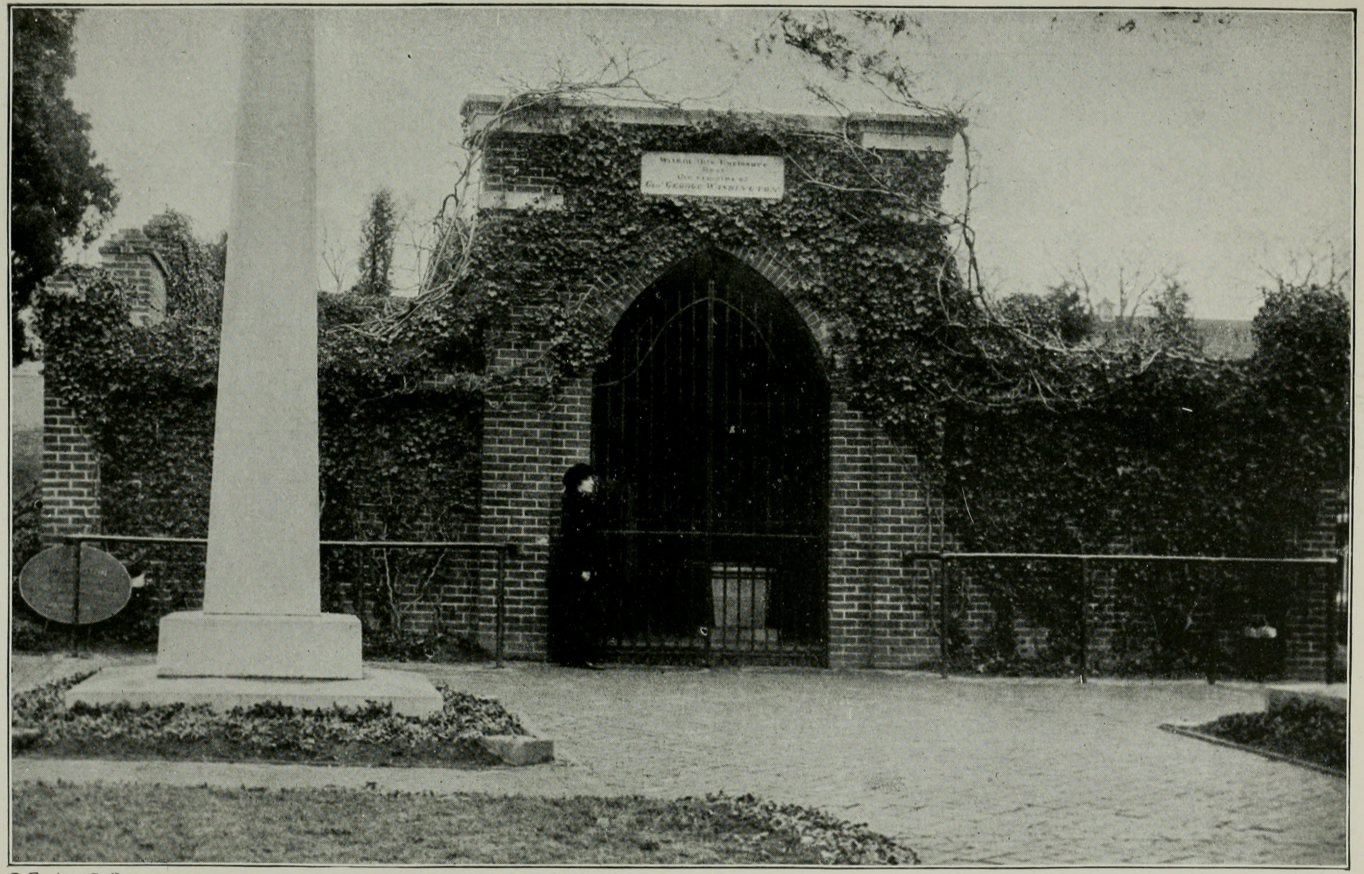
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THE CHAMBER OCCUPIED BY MARTHA WASHINGTON AFTER HER HUSBAND'S DEATH. THE WINDOW AFFORDED A VIEW OF HIS TOMB



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MOUNT VERNON, HOME OF GEORGE WASHINGTON



© Ewing Galloway

TOMB OF GEORGE WASHINGTON AT MOUNT VERNON



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THE WASHINGTON MONUMENT, SEEN BEYOND THE JAPANESE CHERRY TREES BESIDE THE POTOMAC

WASHINGTON AND LEE UNIVERSITY, an educational non-sectarian institute in Lexington, Va.; was founded in 1749 by the Rev. William Graham as an academy at Timber Ridge meeting house, afterward developed into Washington University, and finally received its present name in honor of General Robert E. Lee, who after the Civil War became its president. He is buried in the college chapel, where a noble recumbent statue in marble marks his resting place. It reported at the close of 1919: Professors and instructors, 30; students, 626. President, H. L. Smith, LL.D.

WASHINGTON MONUMENT, a magnificent monument erected by the American people in honor of George Washington. It stands in the Mall, a public park on the banks of the Potomac and Tiber creek, Washington, D. C. The corner stone was laid by President Polk, July 4, 1848, and Dec. 6, 1884, the cap stone was set in position. The foundations are 126½ feet square and 36 feet 8 inches deep. The base of the monument is 55 feet 1½ inches square, and the walls 15 feet ¼ inch thick. At the 500 foot mark, where the pyramidal top begins, the shaft is 34 feet 5½ inches square and the walls are 18 inches thick. The monument is made of blocks of marble two feet thick, and it is said there are over 18,000 of them. The height above the ground is 555 feet. The pyramidal top terminates in an aluminum tip, which is 9 inches high and weighs 100 ounces. The mean pressure of the monument is 5 tons per square foot, and the total weight, foundation and all, is nearly 81,000 tons. The door at the base, facing the capitol, is 8 feet wide and 16 feet high, and enters a room 25 feet square. An immense iron framework supports the machinery of the elevator, which is hoisted with steel wire ropes two inches thick. At one side begin the stairs, of which there are 50 flights, containing 18 steps each. Five hundred and twenty feet from the base there are eight windows, 18x24 inches, two on each face. The area at the base of the pyramidal top is 1,187¼ feet, space enough for a six-room house, each room to be 12x16 feet. The Cologne Cathedral is 525 feet high; the pyramid of Cheops, 486; Strassburg Cathedral, 474; St. Peter's at Rome, 448; the capitol at Washington, 306, and Bunker Hill monument, 221 feet. The Washington monument is the highest monument in the world; total cost, $1,187,710.31.

WASHINGTON UNIVERSITY, a co-educational non-sectarian institution in St. Louis, Mo.; incorporated in 1853. It has been formed by the union of six schools started at different times: the undergraduate department, which includes the college (1859); the St. Louis Law School (1867); the O'Fallon Polytechnic School (1870); the Henry Shaw School of Botany (1886); the School of Fine Arts; the St. Louis Medical College (1891); and the Missouri Dental College (1892). To the university have been attached three secondary schools: The Smith Academy for boys (1854); the Mary Institute for girls (1859); and the manual training school (1879). It reported at the close of 1919: Professors and instructors, 200; students, 1,367; president, F. A. Hall, LL. D.

WASHITA, or OUACHITA, a river of the United States and an affluent of Red river; flows in a S. E. direction through Arkansas and Louisiana, draining a rich cotton and corn country for a distance of 600 miles. It receives the Saline, La Fourche, Tensas, and Little Missouri rivers, and is navigable throughout the year by steamboats to Camden, a distance of 300 miles. The False Washita traverses the Indian Territory, and joins the Red river above Preston, in Texas.

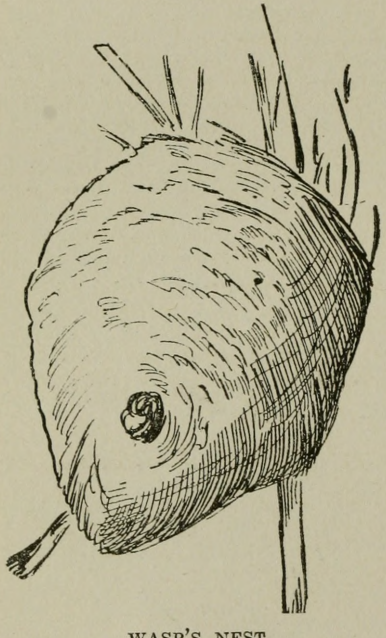
WASP, any species of the genus *Vespa* or of the family *Vespidæ*, particularly the common wasp, *V. vulgaris*. It lives in a hole in the ground, generally about six inches beneath the surface, approached by a crooked entrance of about an inch in diameter. This passage leads to a subterranean room, in which is the vespiary made of gray



COMMON WASP

paper or pasteboard in layers one above the other, and constituting a ball of 13 or 14 inches in diameter, and pierced with two round holes, through which the wasps come in and go out. The interior is occupied by horizontal tiers of combs, like floors in a house, supported by columns, and with passages between. Each cell is hexagonal, as in the combs of bees, but the material is paper. These tiers of cells are built in succession, the upper ones first. Sexually wasps are of three kinds, males, females, and neuters,

the two latter armed with an exceedingly venomous sting. The last are the workers in the hive; they also go out to bring in provisions for the community. Wasps are nearly omnivorous, feeding on honey, jam, fruit, butcher's meat, and any insects which they can overpower. A share of these viands is given to the males and females, whose work lies more in the vespiary. The combs of a large nest may amount to more than 15,000. In these the females, which are few in number, deposit eggs, hatched in eight days into larvæ. These again go into the chrysalis state in 12 to 14 days more, and in 10 more are perfect insects. The males do no work. Most of the workers and all the males die at the



WASP'S NEST

approach of winter, and in the spring each surviving female having been impregnated in autumn, looks out for a suitable place to form a new vespiary. A wasp's nest may be destroyed by burning sulphur inside the hole. The economy of the other social wasps is essentially the same, whether like *V. holsatica*, they build a nest of paper in trees, or, like other Polistes, place their combs in trees or bushes without a papery defense. The economy of the solitary wasps is essentially that of their type, *Odynerus*, differing only in the material and locality of their nests, some building them of clay or agglutinated sand, and attaching them to or placing them in holes in walls, while a few burrow in sandy ground.

WASTE LANDS, according to the general use of the term, uncultivated and unprofitable tracts in populous and cultivated countries. The term waste lands is not employed with reference to land not reduced to cultivation in countries only partially settled.

WATCH, any contrivance by which the progress of time is perceived and measured; as a timekeeper actuated by a spring, and capable of being carried on the person. The essential difference between a clock and a watch has been defined to be that the latter will run in any position, but the former in a vertical position only. Since the invention of the cheap spring clock this definition must be abandoned. Another characteristic which was formerly distinguishing was that the watch escapement was always controlled by a balance wheel and spring, while the clock escapement was generally governed by a pendulum. Watches are said to have been invented at Nuremberg, about the end of the 15th or beginning of the 16th century. The essential portions of a watch are the dial, on which the hours, minutes, and seconds are marked, the hands, which by their movement round the dial point out the time, the train of wheels, which carry round the hands, etc., the balance, which regulates the motion of the wheels, and the mainspring, whose elastic force produces the motion of the whole machinery. The works are inclosed in a case of metal, usually silver or gold. The shape is now universally circular and flat, so as to be easily carried in the pocket. The early watches had but one hand, and required winding twice a day. The spring was at first merely a straight piece of steel, not coiled. A spring to regulate the balance was first applied by Dr. Hooke, 1658; this was at first made straight, but soon improved by making it of spiral form. A repeating watch, or repeater, has a small bell, gong, or other sounding object, on which the hours, half hours, quarters, etc., are struck on the compression of a spring. The most perfect form of watch is the CHRONOMETER (*q. v.*)

WATER, a clear, colorless, transparent liquid, destitute of taste and smell, and possessing a neutral reaction. It is one of the most important and most widely distributed substances in nature, occurring universally in one or other of its three physical states = liquid, solid, or gaseous. As a liquid it constitutes the great mass of the oceans, rivers, and lakes, which cover nearly three-fourths

of the earth's surface; in the solid state it exists permanently in the form of ice or snow in the polar regions; and as a vapor is a constituent of the aërial envelope of the earth, and the exhalations of volcanoes and boiling springs. It occurs in combinations in many mineral substances, and also in organic bodies, animals, and plants containing from 80 to 90 per cent. Water is the most efficient of all solvents, there being few substances which are not, to some extent, affected by it, hence natural waters never occur absolutely pure, but contain in solution more or less of the constituents of the strata through which they have passed. Rain water contains substances derived in minute quantities from the atmosphere, such as ammonia, nitrate of ammonia, carbonic acid, nitrous and sulphurous acids. Spring water always contains a much larger proportion of dissolved substances than rain water. When this is so highly charged with saline or gaseous constituents, as to have a peculiar taste or smell, and is unfitted for ordinary use, it is called MINERAL WATER (*q. v.*), and when the amount of these constituents does not sensibly affect its taste, etc., it is described as fresh water. Sea water is essentially a mineral water, its saline constituents consisting of the chlorides and sulphates of sodium, potassium, magnesium, and calcium, together with minute quantities of silica, bromine, iodine, phosphoric acid, etc. The total solid contents of sea water in mid-ocean varies from 30 to 40 grammes per liter, being largest near the equator and smallest near the poles. A cubic inch of fresh water at 42° weighs .036126 pounds. A cubic foot weighs 62.231 pounds. A cubic foot contains 6.2321 gallons. One gallon weighs 10 pounds. A ton comprises 35.943 cubic feet. Salt water is slightly heavier than fresh.

The term water is applied to the color or luster of a diamond or pearl, and occasionally of other precious stones; as, a diamond of the first water—*i. e.*, one perfectly pure and transparent. In chemistry, H_2O. Water was long regarded as an element, but toward the end of the 17th century it was shown by Lavoisier to be a compound, and to consist of 2 parts by weight of hydrogen to 16 of oxygen, or two volumes of hydrogen to one of oxygen. When pure it is free from taste and smell, and at ordinary pressure is liquid between 0° and 100°, boils at 100°, and freezes at 0°C., expanding to the extent of one-eleventh of its volume. The quantity of heat absorbed in the melting of ice is sufficient to raise the temperature of an equal weight of water 79.2°, and the quantity of heat rendered latent by water at 100°, becoming vapor, would raise the temperature of water 5.37 times as much as from 0° to 100° C. Water is 825 times heavier than air, and when converted into steam expands to nearly 1,600 volumes. One cubic centimeter at 4°, and under a pressure of 760mm. of mercury, weighs 15.432349 grains, or one gramme, the unit of weight in the metric system.

WATER BED, a device that originated with Dr. Neil Arnott, one of Queen Victoria's physicians. It consists of a trough of the dimensions of a wide sofa or a bed, having six or seven inches depth of water in it, and over it a caoutchouc covering on which clothes and pillows are laid as in a common bed. A more convenient and portable contrivance is the water mattress, consisting of a coutchouc or waterproof bag of the size of an ordinary mattress, which may be filled with water of any degree of temperature, or with air, as may be desired. The water bed is exceedingly useful in many diseases, but it is frequently a considerable time before the patient can become accustomed to its use, and some can never be reconciled to it.

WATER BEETLES, beetles which live on or in the water, especially the somewhat similar *Amphizoidæ*, *Haliplidæ*, *Dytiscidæ*, and *Gyrinidæ*, and also the quite different clavicorn *Hydrophilidæ*.



WATER BEETLE AND LARVA

The *Dytiscus*, common in stagnant water, is olive-green above, and oval in shape. The respiratory organs of the perfect insect are not adapted to obtaining air from the water; the creature must therefore come occasionally for air to the surface of the water, where it lies on its back, the openings of its airtubes, which are in the last segment of the abdomen, being exposed.

WATER BRASH, an affection of the stomach, the result of a general functional debility of that organ, by which

the vessels that should secrete the gastric juice throw out a clear, limpid water; hence its medical name of pyrosis. The symptoms of this disease usually commence when the stomach is empty, either in the morning or the afternoon, and begin with a sense of burning heat and constriction at the pit of the stomach, producing a sensation as if the organ was being drawn up to the spine. To relieve this sensation, the patient folds his arms over his chest, and bends the body forward; after a time, a quantity of gas collecting in the stomach leads to an eructation, the patient bringing up from two to four ounces of clear, limpid water, sometimes, though rarely, acid, but generally insipid. Two or three eructations, with a gush of water after each, concludes the paroxysm, and for the time the patient is relieved of his suffering. Females are more subject to this disease than men, and those who live on a milk or farinaceous diet more than those who partake of a good stimulating dietary. Water brash is an affection to which those of a sedentary habit, and who eat their meals hurriedly, without proper mastication, are liable.

WATER BUG (otherwise "WATER SCORPION" and "WATER BOATMAN"), the name given to a section of the hemipterous family *Notonectidæ*. The hind legs are long, and adapted for swimming. The body is prismatic in form, convex above and flat beneath, and the head is as large and as wide as the body. The antennæ are four-jointed. *Notonecta* is the typical genus of the family. To the allied family *Nepidæ* also belong species of the water bug, more especially named "water scorpion." *Nepa cinerea* is a familiar species. In *Nepa* the body terminates in a long breathing tube, and the antennæ are three-jointed. The water bug is predaceous, living chiefly on the larvæ of other insects.

WATERBURY, a city in New Haven co., Conn.; at the confluence of the Naugatuck, Great Brook, and Mad rivers, and on the New York, New Haven and Hartford, and the New England railroads; 33 miles S. W. of Hartford. Here are the Academy of Notre Dame, St. Margaret's School ((P. E.), a high school, a Masonic Temple, a State armory, public library with over 50,000 volumes, many handsome churches and residences, waterworks, street railroad and electric light plants, National savings, and other banks, and several daily and weekly newspapers. Waterbury is famous as the center of a vast manufacturing business in watches and clocks and is the first city in the United States in brass manufactures. Other manufactures include buttons, plated ware, pins, hooks and eyes, percussion caps, carriages, lamps, etc. The metal working industries were established here prior to 1800, and for a long period Waterbury was the only city in the United States engaged in these industries. The town was incorporated in 1686, and received its city charter in 1853. In February, 1902, a large part of the business section of the city was destroyed by fire, but it was quickly rebuilt. Waterbury was one of the chief producers of munitions during the World War. Pop. (1910) 73,141; (1920) 91,-715.

WATER-COLOR PAINTING, the most delicate of the graphic arts, is in an especial sense an English art. It was in England first that it attained to the dignity of a recognized artistic pursuit, and came to be—what it now is—admittedly the rival of oil painting in brilliancy and power. It has had a large share in the modern prosperity of the fine arts, and of late has been practiced by eminent artists in various countries, as France, Germany, Austria, and the United States. In the illumination of missals water colors were used mixed with the body white; and the same is true of the miniature painting of the 18th century. Frescoes and painting in tempera were also in a sense works in water color. But the art of water color, as we now understand the term, had its origin in quite a different way. Dürer and certain of the German, Flemish, and Dutch artists were accustomed to outline drawings with a reed pen, and fill in those outlines with an auxiliary flat wash. Gradually the hard lines were replaced by touches with the brush, and the result was a monochrome in browns and grays, bistre or India ink. These again came to be tinted, and so suggested the full use of colors. Rembrandt often drew in brown, and added dashes of strong color; and Rubens produced something very like modern water-color drawings.

The modern art became emancipated from the old traditions by "gradual disuse of the general shadow tint, and imitation of the local color, not alone of the objects themselves, but of every modification resulting from light, dark, half-tint, or distance, a method which at once led to far greater truth and richness than could ever have been attained by merely passing color over the universal shadow tint." The stained drawing gradually gave way to the more perfect tinted drawing. But the tinted style

predominated till 1790; and it may be said that the water colors of the 18th century were tinted monochromes. It was in the 19th century that Girtin and Turner showed what scope and power there were in the art.

Artists who used the stained and tinted manner were Malton (1726-1801), Paul Sandby, R. A. (1725-1809), often called, though without justification, "the father of the water-color art;" also, all in the last half century, Grimm, Webber, Clevely, Paris, and Rooker. Wheatley, Westall, and Gilpin used water color as well as oil. Rowlandson, Cristall, Hills, Wright, Mortimer, Gresse, Hearne, J. R. Cozens, and Dayes greatly promoted the growing art. Nicholas Pocock (1749-1831) displayed a new richness and force. John Smith (Warwick Smith) first got beyond the weakness of mere tinting. Thomas Girtin (1775-1802) attained great richness of tone and breadth; his compositions were grand but simple; he massed light and shade in broad and sometimes abrupt forms. J. M. W. Turner (1775-1851) soon distanced all his predecessors and contemporaries, and in his hands water-color painting became a new art. He wholly abandoned preliminary tinting; minute details are imitated in local color; his work is marked by breadth, fullness, warmth as well as grace. Other more or less important names are those of Delamotte, Varley, J. J. Chalon, A. E. Chalon, Samuel Prout, Peter de Wint, Liverseege, Cotman, David Cox, Essex, Richardson, Newton, Bonington, Copley, Fielding, Robson, W. Hunt, Ross, Harding, Cattermole, Holland, Penley, Lewis, Houghton, and Pinwell; more recent are Birket Foster, Sir John Gilbert, etc. Among well-known American water-color painters are: Winslow Homer, J. Francis Murphy, Childe Hassam, Robert Blum, Gifford Beale, Arthur Davies, John Sloan, Alexander Wyant, Thure de Thulstrup, etc. There are water-color clubs in New York, Philadelphia and other American cities.

The Society of Painters in Water-Color was instituted in 1804; it held its first exhibition in 1805; and its annual exhibitions are now as crowded as those of the Royal Academy. Formal recognition of its dignity was accorded in 1882, when the society obtained a charter, and became the Royal Society of Painters in Water-Color. There are other similar associations, as the Institute of Painters in Water-Color. An admirable collection illustrative of the history of the art may be studied in the South Kensington Museum.

WATER COLORS, pigments prepared for the use of artists and others by mixing coloring substances in the state of fine powder with a soluble gum such as gum arabic. These are made up in the form of small cakes, which are rubbed down with water and applied with a brush to paper, ivory, and some other materials. Moist water colors are made up with honey or glycerine as well as gum, and are prepared so as to be kept in small earthenware pans or metallic tubes. Dry cakes require to be rubbed down with water on a glazed earthenware palette or slab, but moist colors can be mixed with water for use by the friction of a brush, so that the japanned lid of the box which contains them serves for a palette. The latter are accordingly very convenient for sketching from nature.

WATER CRESS. See NASTURTIUM.

WATER CURE See HYDROTHERAPY.

WATER DOG, a variety of the dog having a curly coat, long ears, a rounded head, and webbed toes. It seems to be allied to the poodle, but differs from the latter in its firmer set and stouter body, and in its larger size. The water dog is highly intelligent, but less so than the retriever. It is usually of a grayish white varied with black and brown.

WATERFALL, or **CATARACT**, the leap of a stream over a ledge or precipice occurring in its course. Many waterfalls are remarkable for their sublimity, the grandest being the Falls of Niagara, on the Niagara river, between Lakes Erie and Ontario, the river having here a fall of about 160 feet. Among other notable falls are those of the Montmorency river, a tributary of the St. Lawrence, which are 242 feet in height; that of the Potaro river, in British Guiana, about 822 feet high and 369 feet broad; that of the Yosemite river, California, which makes a perpendicular leap of 2,100 feet; the Victoria Falls, on the Zambesi river, in south Africa, about 370 feet high and 1,860 yards broad. The cataract of the Riukanfoss, on the river Maan, in Norway, is about 900 feet high. The cascade of Gavarnie, in the Pyrenees, is reputed the loftiest in Europe, being about 13,000 feet, but its volume is so small that it is converted into spray before reaching the bottom. The fall of the Staubbach at Lauterbrunnen, in Switzerland, is between 800 and 900 feet, but has also a very small volume of water; the falls of the Rhine at Schaffhausen, renowned over Europe, are 300 feet broad and nearly 100 feet in height. In Italy the falls of Terni,

on the Velino, and those of the Anio, of Tivoli, are artificial but very beautiful. Among British waterfalls, the falls of the Clyde, three in number, viz., Bonniton Linn, 30 feet, Corra Linn, 84 feet, and Stonebyres Linn, 80 feet, are remarkable for their beauty and grandeur. The falls of the Foyers river on the E. side of Loch Ness are also very remarkable.

WATER FLEA, a popular name for minute aquatic Crustaceans such as daphnia among *Cladocera*, cypris among *Ostracoda*, and cyclops among *Copepoda*. The common *Daphnia pulex*, abundant in fresh water, is a good representative.

WATERFORD, a city and capital of Waterford co., Ireland; itself a county of a city; on the right bank of the Suir; and connected with its N. suburb of Ferrybank, by a bridge. Of several Catholic places of worship, including a cathedral, the finest is the Dominican Church of St. Savior; and the Protestant Episcopalians have also a cathedral and several churches. Other buildings are the Protestant Episcopal palace, the Catholic College of St. John, St. Dominic's Industrial School, convents, a town hall, market house, etc. Considerable sums have been expended in deepening the channel of the Suir, whose S. bank is fringed for a mile by a spacious quay, while on the Kilkenny side is a shipbuilding yard, with a patent slip, graving bank, and dock. Besides two immense bacon-curing establishments, Waterford has iron foundries, flour mills, breweries, etc. A memorial of Waterford's foundation by the Danes in the 9th century is "Reginald's Tower" (1003), which has witnessed the city's capture by Strongbow (1170), the repulse of Cromwell and surrender of Ireton (1649-1650), and the embarkation of James II. after the battle of the Boyne (1690). Pop. about 30,000.

WATER GAS, gas obtained by the decomposition of water. Water in the form of steam is passed over red-hot coke, resolving it into hydrogen and carbonic oxide, the oxygen being absorbed. The hydrogen and carbonic oxide are then passed through a retort, in which carbonaceous matter, such as resin, is undergoing decomposition, absorbing therefrom sufficient carbon to render it luminous when burned.

WATER GLASS, a substance which, when solid, resembles glass, but is slowly soluble in boiling water, though it remains unaffected by ordinary atmospheric changes. It consists of the soluble silicates of potash or soda, or a mixture of both. It is prepared either by breaking down and calcining flint nodules, the fragments or particles of which are then added to a solution of caustic potash or soda, whereupon the whole is exposed for a time to intense heat, or by fusing the constituents together in a solid state, and afterward reducing them to a viscid condition. Among the purposes to which water glass is applied are painting on glass, coating stone, wood, and other materials to render them waterproof, glazing scenery and paintings, fixing wall paintings, etc.

WATER HEN, the *Gallinula chloropus*, generally distributed throughout the world. Length of male about 13 inches; back, wings, rump, and tail rich dark olive-brown; head, neck, breast, and sides dark slate gray; thighs and flanks streaked with white, belly and vent grayish white; under tail coverts white; beak yellowish, becoming red, as Pennant notes, in the breeding season; naked patch on forehead red; red garter above tarsal joint; legs and toes greenish-yellow, claws dark-brown. The female rather larger and more vividly-colored than the male. They frequent ponds covered with aquatic herbage, overgrown water courses, and the banks of slow rivers, swimming and diving with facility, assisted by an expansion of the membrane along the sides of the toes.

WATERHOUSE, ALFRED, an English architect; born in Liverpool, England, July 19, 1830; studied architecture in Manchester, France, and Italy; gained the competition for the Manchester Assize Courts, and also designed the Owens College and the town hall in that city. Among his chief works in London are the Natural History Museum at South Kensington, the New University Club, the National Liberal Club, the New St. Paul's Schools, the City and Guilds' institute, and University College Hospital. He also partly reconstructed Balliol College, Oxford, and Caius and Pembroke, Cambridge. He was elected a royal academician in 1885. He died in London, Aug. 22, 1905.

WATER LILY (*Nymphæ*), an exogenous aquatic plant of the order *Nymphæaceæ*, including eight genera, and all possessing submerged root stocks. They are found in all temperate climates, and attain great size in the tropics. *N. alba* is the familiar flower of ponds and placid streams throughout Great Britain and North America, its large and chaste flowers claiming precedence for beauty among the indigenous flora. *N. lotus* has similar flowers, but tinted with pink, and has strongly toothed

floating leaves; it is the white lotus of the Nile. The blue lotus (*N. cærulea*) has fragrant blue flowers. Several species and numerous varieties are in cultivation as ornamental plants, including the above and *N. odorata* of North America. In India the seeds are used as food. In the allied genus *Nuphar* the flowers are yellow, and the common species (*Nuphar luteum*) is known as the yellow water lily.

WATERLOO, a city and county-seat of Blackhawk co., Ia.; on the Cedar river, and on the Illinois Central, the Chicago Great Western and other railroads; 6 miles E. S. E. of Cedar Falls. Here are a court house, numerous churches, West High School, Collegiate Institute, Conservatory of Music, School for Stammerers, waterworks, street railroads, electric lights, National and other banks, and several daily, weekly and monthly periodicals. The city has flour mills, foundries, woolen mills, and manufactures of farming implements, furniture, electric cars, gasoline engines, locomotives, paper, machinery, etc. Pop. (1910) 26,693; (1920) 36,230.

WATERLOO, BATTLE OF, an important battle won by the allied forces over Napoleon, near Waterloo, a Belgian village 11 miles S. of Brussels, June 18, 1815. The preliminary battles had been at Ligny, June 16 (when Napoleon had defeated the Prussians under Blücher), and at Quartre-Bras, on the same day (when the allies under Wellington compelled the French Marshal Ney to retire). At Waterloo the French numbered about 72,000. The allies (British, Dutch, and Germans), under Wellington, had about 67,000; the Prussians (about 50,000 more), under Blücher, came up in time to take part in the close of the battle, and in the pursuit. The battle began about 11:30 A. M. Briefly it may be said to have consisted of a series of brilliant, but unsuccessful charges made by the French, and dogged resistance on the part of the British; in the evening the French Old Guard charged, but unavailingly; after which the allies advanced. The French lost about 35,000, and many prisoners; the allies about 22,000. Marshal Grouchy, though he defeated Blücher at WAVRE (*q. v.*), June 18, failed to prevent him from joining Wellington, and himself failed to come to Napoleon's aid, though but a few miles distant. The rout of the French was complete, and the disaster final to Napoleon, the result being his deposition and exile to St. Helena.

WATER METER, a contrivance for measuring the amount of water received or discharged through an orifice. There are numerous varieties. Also an instrument for determining the amount of water evaporated in a given time, as from a steam boiler.

WATER POWER, a general phrase applied to the various means by which the energy of moving water may be utilized. To make such a source of energy effectual, it is necessary and sufficient to have water falling from a higher to a lower level; in other words the water must have what is technically called a "head." Such conditions more or less favorable exist in all streams, though in many cases the fall is so slight and therefore the volicity of the water so small that practically no useful work can be obtained. In such cases, by the construction of dams or otherwise, the energy may be stored up as potential energy in a large mass of water to be transformed at will. Even where the stream is one which is directly available for performing useful work, it is usually advisable to collect the water in reservoirs, since the quantity of flow of most streams varies considerably with the seasons. Even with such precautions the supply of water may be far from uniform, overflowing the dams in the wet season and hardly filling them in the dry weather.

Given the available fall and the total quantity of water which flows in a given time, the potential energy which is lost is expresed in foot pounds by the product of the mass in pounds multiplied by the height through which the water has fallen. This energy is mainly transformed into the kinetic energy of running water, while part is transformed into heat and sound. If the former portion could be wholly transformed into useful work, the water would be brought to rest; but as this is never practically realized, we see that the available energy of a fall of water is much smaller than the total transformable energy.

Of the various machines by which the necessary transformation is usefully effected, the most common are what are known as water wheels, in their several forms of turbines, undershot wheels, breast wheels and overshot wheels. The last three are very similar in construction, and are made to rotate round a horizontal axis by the action of the water on the floats which are fixed at equal intervals more or less radically round the circumference of the wheel.

In the overshot wheel, which is applicable to falls of from 12 to 60 feet, the water is received in the bucket-shaped partitions in the circumference, and by its weight, aided in some measure by the

initial impact, drives the wheel round, the upper part moving in the direction of the flow water. The water escapes below as each partition during the rotation of the wheel is turned face downward. The breast wheel acts very similarly, and is applicable to falls smaller than those for which the overshot wheel can be conveniently used. The upper circumference of the wheel is higher than the feeding channel of the water, which enters at a point usually a little above the center of the wheel. The undershot wheel is used where the momentum only of the current can be utilized, the impact of the water upon the floats forcing the wheel round. There is necessarily a considerable waste of power in the undershot wheel, which was to a certain extent remedied by Poncelet when he introduced curved instead of plane floats.

The turbine or vortex wheel is usually horizontal, rotating round a vertical axis. In the original form of turbine, invented by Fourneyron in 1823, water was introduced from above into a central chamber, from which it radiated through curved radial chambers. From these it was projected on the curved floats of the wheel, which was forced round by the reaction of the escaping water.

Though it is from rivers and streams that we derive all the water power which is profitably used, there is no doubt that in the tides we have a great and remarkably constant source of energy, if it could be utilized. Suggestions have not been wanting as to methods for utilizing this energy, but as yet nothing practical has resulted.

WATER SCORPION, the popular name of *Nepa*, a genus of hemipterous insects, the species of which inhabit ponds, etc. Some of them are powerul insects, two or three inches in length. They receive their popular name from the scorpion-like form of the forelegs, with which they seize their prey.

WATERSPROUT, a remarkable phenomenon occurring for the most part at sea, but occasionally on land, though generally in this latter case in the neighborhood of water. A waterspout at sea is usually formed in the following manner: A dense cloud projects from its center a body of vapor, in form something like a sugar loaf with the point downward. This cone is agitated by the wind till it assumes a spiral form, and gradually dips more and more toward the sea, where a second cone is formed having its point upward. The clouds above and the water below are violently agitated by the physical influences at work. Suddenly the descending and ascending cones of water or vapor meet in mid-air, and form one united pillar which moves onward vertically in calm weather, but obliquely to the horizon when acted on by the wind. The junction of the two cones is generally accompanied by an electric flash. After continuing in this form for a short time the waterspout bursts, in some cases with terrific violence, and to the destruction of anything in the vicinity. Many a ship has been overwhelmed in this manner, and sunk in a moment with all on board. In November, 1885, five vessels were destroyed by a waterspout in the harbor of Tunis. Waterspouts on land are cones or pillars of vapor descending from the clouds. Land waterspouts are usually very destructive in their effects. On Aug. 30, 1878, the town of Miskolcz, in Hungary, was destroyed by a waterspout with considerable loss of life. These phenomena are, however, more common in India than in Europe. One which occurred at Dum-Dum, near Calcutta, was ascertained to be 1,500 feet in height, and it deluged half a square mile of territory to a depth of six inches.

The cause of these phenomena has been assumed to be (1) electricity; (2) vortical motion; or (3) a combination of these causes. M. Weyher has, however, succeeded in producing them artificially, and his method shows that vortical motion is the great factor in the production of waterspouts. By means of a rotating tourniquet placed over cold water, an aërial eddy is caused which draws up the water, in the form of a spout composed of drops, to a considerable height; when the water is heated a clearly defined waterspout is seen. With from 1,500 to 2,000 rotations per minute, the vapor from heated water condenses into a visible sheath, enveloping a clearly defined and rarefied nucleus, conical, and tapering downward. As in natural marine spouts, water drops are carried up and thrown out beyond the influences of the upward current.

WATERTOWN, a town of Massachusetts, which includes several villages, in Middlesex co. It is on the Charles river, and on the Boston and Maine railroad. It is chiefly a residential suburb of Boston, but has also important industries, including the manufacture of automobiles, rubber goods, stoves, soap, furnaces, etc. It has a public library and is the seat of a United States arsenal. The town was settled and incorporated in 1630. Pop. (1910) 12,875; (1920) 21,457.

WATERTOWN, a city and county-seat of Jefferson co., N. Y.; on the Black river, and on the Boston and Maine railroad; 69 miles N. of Syracuse. The

river here has rapids and falls which furnish good water power and is spanned by a number of bridges. The city contains the Convent of the Immaculate Conception, Irving School, a high school, State armory, Henry Keep Home for the Aged, business college, Orphans' Home, public library, public park, National and savings banks, electric street railroads, electric lights, and daily, weekly, and monthly periodicals. It has manufactories of machinery, sleighs, electrical apparatus, furniture, printing presses, agricultural implements, air and vacuum brakes, carriages, wagons, woolen goods, paper, thermometers, lamps, tinware, etc. Pop. (1910) 26,730; (1920) 31,285.

WATERTOWN, a city of South Dakota, the county-seat of Codington co. It is on the Big Sioux river, and on the Chicago and Northwestern, the Chicago, Rock Island and Pacific, the Great Northern, and other railroads. In the midst of picturesque scenery and a popular summer resort, it is also the center of an important farming and cattle-raising region, and has grain elevators, and warehouses, flour mills, and manufactories of agricultural implements, carriages, etc. Pop. (1910) 7,010; (1920) 9,400.

WATERTOWN, a city in Dodge and Jefferson cos., Wis.; on the Rock river, and on the Chicago and Northwestern, and the Chicago, Milwaukee, and St. Paul railroads; 45 miles W. by N. W. of Milwaukee. Here are the Northwestern University (Luth.), the Sacred Heart University (R. C.), a high school, several churches, libraries, electric lights, National and State banks, and daily and weekly newspapers. Watertown is an important barley and cheese market, and has a shoe factory, foundry, brass works, mills, etc. Pop. (1910) 8,829; (1920) 9,299.

WATER TURKEY, the *Plotus anhinga*. According to Ripley and Dana, this bird is a constant resident in Florida, and the lower parts of Louisiana, Alabama, and Georgia; in spring it goes up as far N. as North Carolina, breeding along the coast; in these various localities it bears the name of water crow, Grecian lady, water turkey, and cormorant.

WATER VASCULAR, in biology, a term applied to a system of canals, in the *Annuloidea*. They communicate with the exterior, and open internally into the perivisceral cavity. Their function is not certainly known, but they are probably excretory and respiratory.

WATERVILLE, a village in Kennebec co., Me.; on the Kennebec river, and on the Maine Central railroad; 18 miles N. of Augusta. Here are COLBY COLLEGE (*q. v.*), Coburn Classical Institute, high school, several libraries, waterworks, street railroad and electric light plants, National and savings banks, and a number of daily, weekly, and monthly periodicals. The city contains the car and locomotive works of the Maine Central railroad. It also has pulp, paper, and cotton mills, sawmills, plow, axe, hoe, and scythe factories, machine shops, tanneries, etc. Pop. (1910) 11,458; (1920) 13,351.

WATER VINE, in botany, the *Phytocrene gigantea*, a large climber occurring in Martaban. The wood, which is soft and porous, discharges when wounded a quantity of pure, tasteless, and wholesome fluid, drunk by the natives. Also the *Tetracera potatoria*, a climber about 20 feet long, with yellow flowers. A native of Sierra Leone.

WATERVLIET, a city in Albany co., N. Y.; on the Hudson river, the Erie canal, and the Delaware and Hudson railroad; opposite Troy. Prior to 1896 it was known as the village of West Troy. Here are the famous Watervliet Arsenal, founded in 1807 by the United States Government, street railroads, electric lights, numerous churches, a National bank, and a weekly newspaper. The arsenal plant contains extensive foundries, and shops for the manufacture of siege, coast defense, and field guns, shot and shell, gun carriages, and small ammunition. The city also has large car works, and an extensive and noted bell foundry. Pop. (1910) 15,074; (1920) 16,073.

WATER WHEEL. See TURBINE: WATER POWER.

WATKIN, SIR EDWARD WILLIAM, an English railway manager; born in Northenden, Cheshire, England, in 1819. He was engaged in his father's London warehouse from the time he was 10 years old, till 1845, when he was appointed secretary to the Trent Valley Railroad Company. From this post he came by stages to be general manager of the London and Northwestern Company, director and chairman of the Manchester, Sheffield, and Lincolnshire Railway, president of the Grand Trunk Railway of Canada, chairman of the South Eastern, and director of the Great Western and Great Eastern Companies. While he was president of the Canadian road he undertook, at the instance of the Duke of Newcastle, negotiations with the five British North American provinces, which resulted in the passage of the Confederation Act and the establishment of the union between the provinces.

For this service he was knighted. He was intimate with Disraeli, Cobden, and Salisbury, and had been a friend to Dickens. He died in London, April 14, 1901.

WATKINS GLEN, a remarkable ravine and pleasure resort near the head of Seneca Lake in the W. central part of New York. It has become famous owing to its attractive scenery, which draws thousands of visitors each year. The rocks consist of Devonian shale, which during the Pleistocene period were here cut into deep narrow gorges by the glacial ice. These gorges contain numerous cataracts and have steep, smooth walls.

WATLING'S ISLAND, a small island in the Bahama group, West Indies. It is 18 miles long, and has a lake in its center. It is supposed to be the first land in the New World seen by Columbus, generally known as San Salvador.

WATLING STREET, one of the great Roman highways of Britain, commencing at Dover, passing through Canterbury and Rochester to London, and thence to Chester and York, and N. in two branches to Carlisle and the Wall in the neighborhood of Newcastle. Traces of the ancient road are still to be found in many parts of its course, and in some it is still an important highway; a street in London retains its name. It was the line of division in the treaty between Alfred and Guthrum the Dane, and it is still the boundary between Warwickshire and Leicestershire. Of the "Waetlings" nothing is now remembered. Perhaps a trace also survives in the name Wattlesborough, a place on Watling street near Wroxeter (Uriconium).

WATSON, HENRY BRERETON MARRIOTT, an English novelist, born in Caulfield, Australia, in 1863. He was educated at Canterbury College, New Zealand, and in 1885 removed to England, where he engaged in journalism. He contributed to many reviews and magazines and became best known as a writer of novels of adventure. These include "Lady Faintheart" (1890); "Galloping Dick" (1896); "The Adventurers" (1898); "Hurricane Island" (1904); "The Big Fish" (1912); "The House in the Downs" (1914); "The Affair on the Island" (1916); "Mulberry Wharf" (1917); and "The Excelsior" (1918). He also served on the editorial staffs of several magazines.

WATSON, JAMES CRAIG, an American astronomer; born in Ontario, Can., Jan. 28, 1838; was graduated at the University of Michigan at the age of 19, and appointed Professor of Astronomy in that institution at the age of 21; called to the chair of astronomy in the University of Wisconsin in 1879. He was the discoverer of 23 asteroids, and received the Lalande medal of the Paris Academy of Sciences for the discovery of six of them in one year. He was a member of the Eclipse Expeditions to Iowa in 1869 and to Sicily in 1870, and took charge of the Transit of Venus Expedition to Peking, China, in 1874. He was also the discoverer of several comets. He was for many years the actuary of an insurance company, and accumulated a moderate fortune by commercial enterprises, of which he left $16,000 to the National Academy of Sciences, the income of which is partly devoted to a research fund and partly to the bestowal of the "Watson Medal" of the Academy. His most lasting work was the writing of his "Theoretical Astronomy," a standard work on the computation of orbits and the theory of perturbation. He died in Madison, Wis., Nov. 23, 1880.

WATSON, JAMES E., a United States Senator from Indiana, born at Winchester, Ind., in 1864. He was educated at the De Pauw University. In 1886 he was admitted to the bar. He removed to Rushville, Ind., in 1893, and in 1895 was elected to the 54th Congress. He was elected from the 56th to the 60th Congresses (1899-1909). In 1908 he was the Republican candidate for governor of Indiana. In 1916 he was appointed United States Senator, to fill the unexpired term of Benjamin F. Shively. He was re-elected in 1920.

WATSON, JOHN, pseudonym **IAN MACLAREN**, an English clergyman and author; born in Manningtree, Essex, England, Nov. 3, 1850; was graduated at Edinburgh University (1870); studied theology at New College, Edinburgh, and Tübingen; ordained minister of the Free Church, Logiealmond, Perthshire (1875); called to Free St. Matthew's, Glasgow (1877); translated in 1880 to Sefton Park Church, Liverpool, one of the most important congregations of the Presbyterian Church of England; received Hon. D. D. in 1895 from St. Andrews University, and a similar degree in 1897 from Yale University, where he lectured on preaching (1896). Till 1893 Dr. Watson was known as a popular preacher and able minister; but in that year he acquired additional distinction and wider fame by writing a series of Scotch idylls for the "British Weekly." When collected and published in book form under the title of "Besides the Bonnie Brier Bush," they became widely popular in Great Britain and the United States. "The Days of Auld Lang Syne,"

a second series of idylls, published in 1895, also reached a large circulation. These were followed by other stories which were equally successful. Dr. Watson's religious publications include:



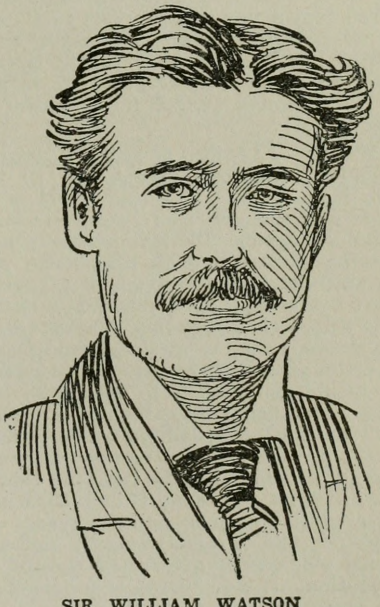
JOHN WATSON

"The Upper Room"; "The Mind of the Master" (1896); "The Cure of Souls"; "The Potter's Wheel" (1897); "Companions of the Sorrowful Way" (1898). He died in 1907.

WATSON, JOHN CRITTENDEN, an American naval officer, born at Frankfort, Ky., in 1842. He graduated from the United States Naval Academy in 1860. In the same year he was appointed a midshipman, was promoted to be lieutenant-commander in 1866, captain in 1887, commodore in 1897, and rear-admiral in 1899. He served during the Civil War and took part in many important engagements. He commanded many ships and filled several offices on land, becoming president of the Board of Inspection, at San Francisco, in 1888. He was captain of the Navy Yard, Mare Island, from 1890 to 1892, and in 1894-5 was a member of the Naval Retiring Board. From 1895 to 1898 he was governor of the Naval Home in Philadelphia. During the War with Spain he commanded a division of the North Atlantic Fleet, and was also commander-in-chief of the Eastern Squadron sent to re-enforce Admiral Dewey's fleet. From 1899 to 1900 he was commander-in-chief of the Asiatic Fleet, and for two years following was president of the Naval Examining Board. He represented the navy at the coronation of King Edward VII. in 1902. He was retired in 1904.

WATSON, ROSAMUND MARRIOTT, an English poet, writing sometimes under the pseudonyms GRAHAM R. TOMSON and R. ARMYTAGE; born in London, England, in 1863. She contributed to English and American periodicals, and edited several anthologies. Her works include: "The Bird Bride" (1889); "A Summer Night, and Other Poems" (1891); "After Sunset" (1895). She died in 1911.

WATSON, THOMAS E(DWARD), a United States Senator from Georgia. He was born in Columbia co., Ga., in 1856, and after studying for two years at Mercer College, taught school. After studying law he was admitted to the bar in 1875, for a time practiced in Thompson, Ga., and was a member of the State House of Representatives in 1882-3. He became identified with the Paulist movement, and was elected to the 52d Congress as a Populist, but contested unsuccessfully the elections of 1892 and 1894. At the Populist National Convention held in St. Louis in 1896 he was nominated for vice-president. For several years he conducted a Populist paper in Atlanta. In 1904 he was nominated for president by the People's party. He began, in 1906, the publication of "Tom Watson's Magazine," in New York. He also edited the "Weekly Jeffersonian." In 1920 he was nominated for United



SIR WILLIAM WATSON

States Senator and was elected. He devoted much time to the study of French history and wrote "The Story of France" (1898); "Life of Napoleon" (1902). His

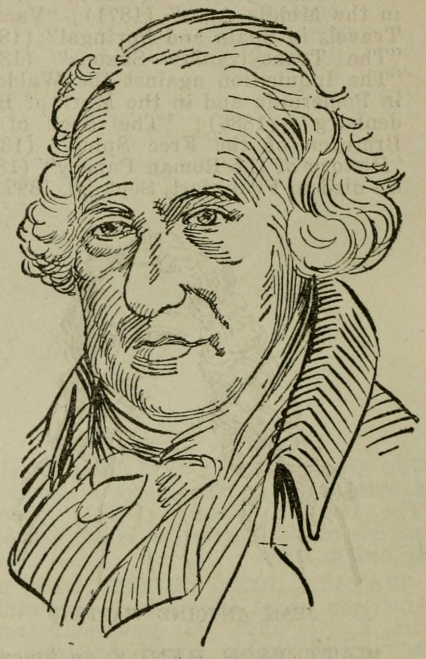
other writings include "Life and Times of Thomas Jefferson" (1903); "Life and Times of Andrew Jackson" (1907); "The Socialist and Socialism" (1909); "The Story of the West and South" (1911).

WATSON, SIR WILLIAM, an English poet; born in Burley-in-Wharfdale, Yorkshire, England, Aug. 2, 1858. His published works include "The Prince's Quest" (1880); "Epigrams of Art" (1884); in the "National Review," a series of political sonnets, "Ver Tenebrosum" (1885); "Wordsworth's Grave and Other Poems" (1891); "Lachrymæ Musarum" (1892), an elegy on Tennyson; "Poems" (1893); "Excursions in Criticism" (1893); "The Eloping Angels" (1893); "Odes, and Other Poems" (1894); "The Purple East" (1896), an attack on the British Government for its failure to act against Turkey for the Armenian massacres; "Collected Poems" (1898); "Heralds of Dawn" (1912); "The Muse in Exile" (1913); "The Man Who Saw" (1917).

WATT, the name of the electrical unit of activity or rate of doing work. It is measured by the product of the voltage or electromotive force of the source into the current supplied. Thus a dynamo which is yielding 30 amperes at a voltage of 100 is working with an activity of 3,000 watts. The watt is equal to 0.735 foot-pound per second; so that one horse power per second is equal to 746 watts. It is customary to use the kilowatt as the practical unit. It is equal to 1,000 watts or 1.2 horse power per second.

WATT, JAMES, a British inventor; born in Greenock, Scotland, Jan. 19, 1736. His father was a merchant and magistrate of Greenock, and James received a good education in its public schools. Having determined to adopt the trade of mathematical instrument maker, he went to London (1754) to learn the art, but ill-health compelled him to return after only a year's apprenticeship. Shortly after his return he endeavored to establish himself in Glasgow. The corporation objecting, he was appointed in 1757 mathematical instrument maker to the university, and resided within its walls till 1763, when he removed into the town. From this time till 1774 he acted as a civil engineer—made several surveys for canals and harbors, and some of his plans were afterward carried into execution. It was during this period that he conceived and gave shape to his improvements on the steam engine, which have rendered James Watt's name famous. To give his inventions practical form he associated himself in the year 1774 with Matthew Boulton, the firm of Boulton & Watt having their works at Soho, Birmingham. He retired from business in 1800.

Watt was a fellow of the Royal Societies of London and Edinburgh, and member of the National Institute of France. He was twice married, and was survived by one son, who carried on the establishment at Soho in partnership with a son of Mr. Boulton. Besides improving the steam engine, Watt invented or improved a variety of mechanical appliances, including a letter-copying press. He was a man of high mental powers generally, and possessed a wide and varied knowledge of literature and science. He died in Heathfield, Staffordshire, Aug. 25, 1819.



JAMES WATT

WATTEAU, JEAN ANTOINE (vätō), a French painter; born in Valenciennes, France, Oct. 10, 1684. In 1702 he went to Paris, and earned his bread by working for decorative painters. For many years he struggled in obscurity, but his talent once recognized, he rapidly became popular and prosperous. In 1717 he was received at the Academy, and enrolled as a painter of *fêtes galantes*, that is, pleasure parties, balls, masquerades, etc., subjects in which he excelled. Lightness, elegance, and brilliancy form the chief attractions of his style. He died in Nogent-sur-Marne, July 18, 1721.

WATTENBACH, WILHELM (vät'-ten-ba*h*), a German historian and palæographer; born in Ranzau, Holstein, Sept. 22, 1819; became Professor of History at Heidelberg, 1862, and 1873 in Berlin University. He was author of "Contributions to the History of the Christian Church in Bohemia and Moravia" (1849); "Introduction to Greek Palæography" (1867); "Introduction to Latin Palæography" (1869); "Writing in the Middle Ages" (1871); "Vacation Travels in Spain and Portugal" (1869); "The Transylvanian Saxons" (1870); "The Inquisition against the Waldenses in Pomerania and in the Mark of Brandenburg" (1886); "The Sect of the Brethren of the Free Spirit" (1887); "History of the Roman Papacy" (1876). He died in Frankfort, Sept. 20, 1897.



JEAN ANTOINE WATTEAU

WATTERSON, HENRY, an American journalist and writer, born in Washington, in 1840. He was educated by private tutors and during the Civil War acted as staff officer on the Confederate side and chief of scouts under General Johnston. He entered journalism following the close of the war, and became the owner and editor of the Louisville "Courier-Journal." His brilliant editorial writing in this paper won him a wide reputation. He was active in politics and was one of the chief supporters of the nomination of President Wilson, in 1912. He was distinguished as an orator and as a historian. His published writings include "History of the Spanish-American War" (1899); "Compromises of Life, Lectures and Addresses" (1902); "Marse Henry, Looking Backward Sketches" (1919). He retired from the editorship of the "Courier-Journal" in 1919.

WATTLE BIRD, an Australian bird (*Anthochæra carunculata*) belonging to the honey eaters, and so named from the large reddish wattles on its neck. It is about the size of a magpie, and is of bold, active habits.

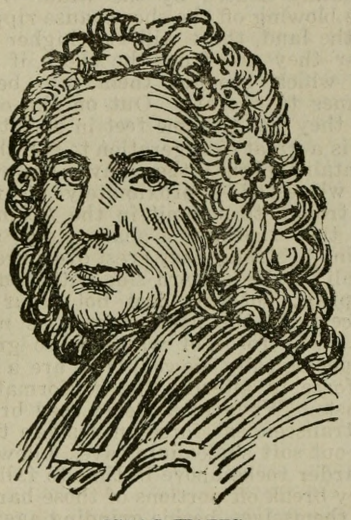
WATTS, ALARIC ALEXANDER, an English educator, poet, and journalist; born in London, England, March 16, 1797. His journalistic work was done with the Manchester "Courier," the London "Standard," and the "United Service Gazette." He edited a series of annual volumes, "Literary Souvenir" (1825-1835) and published "Poetical Sketches" (1822), and "Lyrics of the Heart" (1851). He died in Kensington, England, April 5, 1864.

WATTS, GEORGE FREDERICK, an English painter; born in London, England, in 1817. He first exhibited at the Royal Academy in 1837. In 1842 and 1845 he secured prizes of $1,500 and $2,500 from the Commissioners for the Decoration of the Houses of Parliament for his "Caractacus," and "Alfred Inciting the Saxons to Maritime Enterprise"; afterward painting "St. George and the Dragon" in Westminster Palace, and the "School of Legislation" for Lincoln's Inn. Among his more important pictures are: "Life's Illusion" (1849); "The Window Seat and Sir Galahad" (1862); "Ariadne" (1863); "Esau" (1865); "Love and Death" (1877); "Time, Death and Judgment" (1878); "Happy Warrior" (1884); "Hope" (1886); "Judgment of Paris" (1887); "The Angel of Death" (1888); and "Fata Morgana" (1889). He was one of the most subtle and powerful of portait-painters, among his successful work being Tennyson, Millais, Browning, etc. He was perhaps the greatest idealist in contemporary British art. He became R. A. in 1868, and in 1886 presented some pictures to the nation. He died in 1904.

WATTS, HENRY, an English writer on chemistry; born in London, England, Jan. 20, 1815; in 1837 became demonstrator of Chemistry at University College; librarian to the Chemical Society in 1850; and editor of its "Journal" in 1861. He translated Gmelin's "Manual of Chemistry" (18 vols.) and other chemical works, but is best known by his "Dictionary of Chemistry," based on that of Dr. Ure (5 vols. 1863-1868; new and revised ed. by Morley and Muir, 4 vols. 1889 *et seq.*). He died June 30, 1884.

WATTS, ISAAC, an English hymnologist; born in Southampton, England, July 17, 1674. He studied at a Nonconformist academy at Newington, London; was appointed (1698) assistant clergyman to the congregation worshiping in Mark Lane; some years after (1702) sole pastor of the same body. Forced by bodily weakness to resign his charge (1712),

he spent the rest of his life at the family seat of Sir Thomas Abney, Abney Park, near London. He wrote "Hymns and Spiritual Songs" (1707); "Divine and Moral Songs for the Use of Children" (1720); "A Manual of Logic" (1725); several volumes of "Sermons," besides other works of less note. As a religious poet Watts has been always widely popular. His hymns are marked by religious fervor and evangelical zeal. Widely separated parties have used them as manuals of Christian devotion, and they have come home to the heart of the English common people in a way that no other devotional lyrics, not even Wesley's or



ISAAC WATTS

Cowper's have done. The "Logic" of Watts was for long a widely popular book. Though not distinguished by profound metaphysical thought, it is yet a very able treatise. It is plain and practical, vigorous and sensible, and may even yet be read with profit. The works of Watts were published in a collected form first in six then in nine volumes (Lond. 1810-1812). He died in Theobaldo, Herts, England, Nov. 25, 1748.

WATTS, MARY STANBERY, an American novelist, born in Delaware county, O., in 1868. She was educated at the Convent of the Sacred Heart, Cincinnati, and in 1891 married Miles Taylor Watts. Her novels, which for the most part deal with the Middle West, include "The Tenants" (1908); "Nathan Burke" (1910); "The Rise of Jennie Cushing" (1914); "The Boardman Family" (1918); "From Father to Son" (1919). She also wrote many plays, and contributed many short stories to magazines.

WATTS-DUNTON, THEODORE, an English poet and critic; born in St. Ives, Huntingdonshire, England, in 1832. He was educated at Cambridge; afterward settling in London, he soon became the center of a remarkable literary and artistic company, including Philip Bourke Marston, Rossetti, Browning, Tennyson, Swinburne, etc. He wrote extensively in periodicals, and the books: "Greeting at Spithead to the Men of Greater Britain" (1897); "The Coming of Love" (1897); "Aylwin" (1898).) "The Work of Cecil Rhodes; a Sonnet Sequence" (1907); "Old Familiar Faces" (posthumous, 1916). The poems of his which are most generally known are "The Burden of the Armada" and "The Ode to Mother Carey's Chicken," the latter of which has been often reprinted in England and America. He died in 1914.

WAT TYLER'S INSURRECTION. See TYLER INSURRECTION.

WAUKEGAN, a city and county-seat of Lake co., Ill.; on Lake Michigan, and on the Elgin, Joliet and Eastern, and the Chicago and Northwestern railroads; 35 miles N. W. of Chicago. The principal part of the city is built on a bluff which rises rather abruptly to the height of 50 feet. Here are many churches, a high school, School of the Immaculate Conception, St. Alberta's Convent, St. Joseph's School, public library, waterworks, electric lights, street railroads, National and State banks, and several weekly newspapers. Waukegan is largely interested in the lake fisheries. It has flour mills, tanneries, the Forsyth Scale Works, a pump factory, silver plating establishment, and manufactories of farming implements, sashes, doors, blinds, etc. It also has a trade in grain, wool, and butter. Pop. (1910) 16,069; (1920) 19,226.

WAUKESHA, a city and county-seat of Waukesha co., Wis., on the Fox river, and on the Chicago and Northwestern, and the Chicago, Milwaukee, and St. Paul and other railroads; 20 miles W. of Milwaukee. It contains Carroll College (Pres.), a high school, Keeley institute, the State Industrial School for Boys, electric lights, National bank, and several weekly newspapers. The city is chiefly noted for its wonderful springs of medicinal waters. It has bottling works, quarries of excellent building stone, extensive malleable iron work. Pop. (1910) 8,740; (1920) 12,558.

WAUL, THOMAS NEVILLE, an American lawyer; born in Sumter District, S. C., Jan. 5, 1813; was educated at Columbia College in 1829-1832, and was later admitted to the bar and began prac-

tice in Mississippi; removed to Gonzales co., Tex., in 1850; was a member of the Provisional Congress of the Confederate States in 1861. During that year he recruited 2,000 troops, known as Waul's Legion; was commissioned colonel of this body; and remained with it throughout the war. He rendered the Confederates important services as commander of the defenses at Tallahatchie and Yazoo rivers, Miss., and during the seige of Vicksburg; was promoted Brigadier-General and later took a conspicuous part in the battles of Pleasant Hill and Mansfield, La. He was subsequently seriously wounded while leading a division in the battle of Saline. In 1865 he was a member of the Texas Reconstruction Convention; resumed the practice of law in Galveston, Tex.; and retired in 1896. He died in 1906.

WAUSAU, a city and county-seat of Marathon co., Wis.; on the Wisconsin river; and on the Chicago and Northwestern, and the Chicago, Milwaukee and St. Paul railroads; 42 miles N. E. of Grand Rapids, Wis. Here are numerous churches, court house, County Insane Asylum, waterworks, electric lights, National banks, and daily and weekly newspapers. Large quantities of lumber are here shipped down the river in rafts. The chief industries are those connected with the lumber trade. Besides the lumber industry the city has granite quarries, mills, etc. Pop. (1910) 16,560; (1920) 18,661.

WAVE, one of a series of undulating inequalities on a surface; an undulation; a swelling outline. The undulating streak or line of luster on cloth, watered and calendered. Anything which advances and recedes, rises and falls, comes and goes, or increases and diminishes with some degree of regular recurrence, like a wave; as, a wave of prejudice, a wave of popularity, etc. A waving or undulating motion; a signal made by waving the hand, a flag, or the like.

In physics, an undulation; a movement which, though it seems progressive, is in reality only up and down, or, to a certain extent, to and fro, though it is transmitted to a distance by the fact that at each successive point the otherwise similar motion of a single particle takes place a little later in time = the time which it takes for the motion to be communicated from the preceding moving particle. Waves exist in water, in air (sound waves), in ether (light waves), etc. A wave on the ocean alternately rises into a ridge and sinks into a depression (the trough of the sea). Anything floating, say a quantity of sargasso seaweed, rises on a billow and sinks again as the wave falls, without otherwise changing its place. Even the undulatory movement affects the water only to a few feet in depth, where, unless there are submarine currents, all is still. When a wave comes inshore and enters a narrow gulf, it becomes affected both by the return of the reflex waves from its sides and the friction of the bottom, if the water be shallow, so that instead of a movement mainly up and down, it now becomes progressive, and breaks in a series of billows on the sands or rocks. In the former case the water runs up the sand, and then recedes considerably before the next wave comes in. Sea waves are mainly caused by the wind. If a breeze blowing off the shore cause ripples near the land, these will rise higher the farther they are from the shore if the cause which brought them into being continues to operate. Out on the open ocean they rise to some feet in elevation, but it is a great exaggeration to call them "mountains high"; they have, however, been witnessed approximately 60 feet from trough to summit in the Atlantic. When they rise into a sharp ridge, and the wind is strong, they crest over, break, and fall on the leeward side with abundant spray; but this does not occur on the ocean to the same extent as near shore. The force of waves is so great that, geologically viewed, they are a potent force in altering the conformation of coasts. When in a storm they break with transcendent force on a shore they scoop out soft shales into caves, allowing the harder rocks above in time to fall in, or they break off portions of those harder rocks themselves, beside grinding against each other any fallen slabs which may already be lying on the beach.

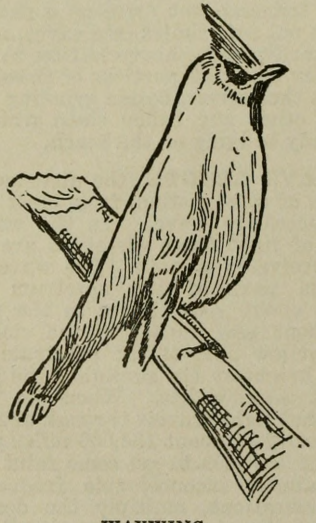
WAVE LENGTH, the distance, in all kinds of wave motion, from crest to crest of successive waves. In the wave motion of light these distances are almost inconceivably minute. The wave in the visible part of the spectrum ranges from about $\frac{1}{33000}$ inches in the red end to about $\frac{1}{63000}$ inches in the violet. In the yellow part of the spectrum, where it is brightest (in sunlight) the wave is about $\frac{1}{57000}$ inches. When we remember that light travels through space with a velocity of about 186,000 miles per second, if we wish to get some faint idea of the almost inconceivable frequency of the vibrations, multiply the denominators of the above fractions by the number of inches in 186,000 miles. We shall find that the extreme red light vibrates about 400,000,000,000,000 times, the yellow light about 510,000,000,000,000 times and the extreme violet light about 800,000,000,000,000 times per second. The

difference of color is simply a difference of wave length and frequency, for, so far as known, they all travel with the same velocity. There are heat rays, or vibrations, which are invisible to the eye, of much greater wave length and less frequency. These are below the visible red in the spectrum. There is no difference between the radiations that we call by the different names of heat, light, and chemical (or actinic) rays except in the wave lengths and frequency of their vibrations.

WAVRE (vävr), a town in the Belgian province of Brabant, 15 miles S. E. of Brussels; pop. about 10,000. Here on June 18, 1815, there was a fiercely contested battle between the Prussians under Thielmann and the French under Grouchy, in which the Prussians successfully prevented the French from joining Napoleon at Waterloo. See WATERLOO, BATTLE OF.

WAX, a name given to various animal and vegetable substances having analogous physical peculiarities, but differing somewhat in chemical constitution and in other properties. They are all hydrocarbon compounds allied to oils and fats, but common wax differs from the ordinary fats in containing no glycerin.

WAXWING (*Ampelis gorrula*), an insessorial bird belonging to the dentirostral section of the order. It derives



WAXWING

its name from the appendages attached to the secondary and tertiary quill feathers of the wings, which have the appearance of red sealing-wax. The Bohemian waxwing sometimes visits England. An American waxwing is the cedar bird.

WAY, in law, either the right which one or more persons have passing over the land of another, or the space over which such right is exercisable. Ways are of various kinds; as a footway, for persons passing on foot only; a horseway, for persons passing on horseback; a driftway, for driving cattle; a carriage way, for driving carriages and other vehicles.

WAYCROSS, a city of Georgia, the county-seat of Ware co. It is on the Atlantic Coast Line, the Waycross and Southern, the Waycross and Western, and the Atlanta, Birmingham, and Atlantic railroads. Its industries include the manufacture of lumber and turpentine, and it has repair shops, cotton gins, etc. It is the seat of the Piedmont Academy, King's Daughters Hospital, Y. M. C. A. buildings, and other public buildings. Pop. (1910) 14,485; (1920) 18,068.

WAYLAND, THE SMITH, a hero of German saga; was originally a kind of demi-god in popular mythology, with points of identity with the Greek Hephæstus and Dædalus. He was son of the sea giant Wade, a nephew of King Wilkinus, and was first bound apprentice to the famous smith Mimir. Then he was carried across the sea to the dwarfs, whom he soon surpassed in their own science. He dwelt a long time in Ulfdaler along with his two brothers, Eigil, the best archer, and Slagfidr, and here they met three swan maidens, with whom they lived for seven years, till these flew away to follow battles as Walkyries. Afterward Wayland came to King Nidung, who cut the sinews of his feet and put him in prison, for which he revenged himself by putting the king's two sons to death, and violating his daughter Baduhild, who afterward gave birth to Wittich. Wayland then flew away in a feather robe, which he himself manufactured, and which his brother Eigil had tried first, only to be precipitated to the ground. The legend is often alluded to in Scandinavian, Anglo-Saxon, English, and German poems, and even old French poems tell of Galant the smith. Wayland Smith's cave, a two-chambered megalithic monument, near the White Horse in Berkshire, England, is immortalized in "Kenilworth."

WAYNE, ANTHONY, an American military officer; born in East Town, Chester co., Pa., Jan. 1, 1745; became a land surveyor; was an intimate friend of Franklin, and early took an active

interest in public affairs. Having married and settled to farming (1767), he was elected to the Pennsylvania convention and Legislature in 1774, served on the committee of safety, and in 1775 raised a regiment with which he took part in the campaign against Canada. He fought with distinction and was wounded at the battle of Trois Rivières (Jan. 3, 1776); held the fortress of Ticonderoga and Mount Independence till May, 1777; and, after receiving the commission of Brigadier-General, led a division at Brandywine (Sept. 11), and commanded the right wing at Germantown (Oct. 4). He made a dashing raid on the British lines in the winter of 1777-1778, carrying off a great quantity of supplies, and on the night of July 15, 1779, achieved the most brilliant of the American victories in the storming of Stony Point, for which he received a gold medal and the thanks of Congress. By a bayonet charge he rescued Lafayette in Virginia in 1782; made a daring attack on the whole British Army at Green Spring (July 6), and defeated the British and Indians in Georgia. After the war "Mad Anthony" retired quietly to his farm, but he was made Major-General in 1792, and again took the field, this time against the western Indians, whom he overthrew at Maumee Rapids, and forced to conclude the treaty of Greenville (1795). On his way back to his farm at Waynesboro he died at Presque Isle (now Erie), Dec. 15, 1796. A monument was erected to him at Waynesboro in 1809.

WAYNESBORO, a borough of Pennsylvania, in Franklin co. It is on the Western Maryland and the Cumberland Valley railroads. It is an important industrial community, having manufactures of engines, boilers, grinders, and other steel and iron products. Pop. (1910) 7,199; (1920) 9,720.

WEASEL, in zoölogy, the genus *Putorius;* specifically, *P. vulgaris*, the common weasel; length about 12 inches, of which the tail occupies nearly a quarter; body extremely slender and arched, head small and flattened, eyes black and remarkably quick and lively, ears short and rounded; the neck is long, being but little shorter than the trunk and very flexible; tail short, and without a terminal tuft of hair; legs short, and furred to end of toes. Upper part light reddish-brown, under surface quite white.

WEATHER BUREAU, the government office maintained by all civilized nations for the systematic observing and predicting of the weather from day to day. Many of these were established before weather predictions were considered practicable or even possible, and in such offices the original object of the institution was the collection of climatic statistics considered as an important item in the description of the country and the study of its agriculture, diseases, and other vital phenomena. Of such older statistical bureaus may be instanced the Meteorological Division of the Suregon-General's Office, U. S. A., of the Statistical Bureau in Berlin, of the Central Physical Observatory at St. Petersburg, and of the office of the Registrar-General, London. Some of these climatic bureaus have had their scope enlarged by the imposition of the additional duty of weather and storm predictions, but in most cases an entirely new office has been established for this special work; such, for instance, are the Meteorological Office in London, founded in 1861 under the Board of Trade, and now under the administration of the Royal Society, the Meteorological Division of the Astronomical Observatory at Paris, enlarged in 1859, and now transferred to the Meteorological Bureau of France; the Seewarte at Hamburg, founded in 1867, now in part transferred to the Royal Meteorological Institute for Saxony at Berlin; the Central Office for Meteorology at Rome; the Meteorological Office of the Customs Bureau at Hong Kong; the office of the Meteorological Reporter for India at Calcutta; the Imperial Signal Office at Tokio, Japan; and the Weather Bureau, formerly of the Signal Office in the Depart-



WEASEL

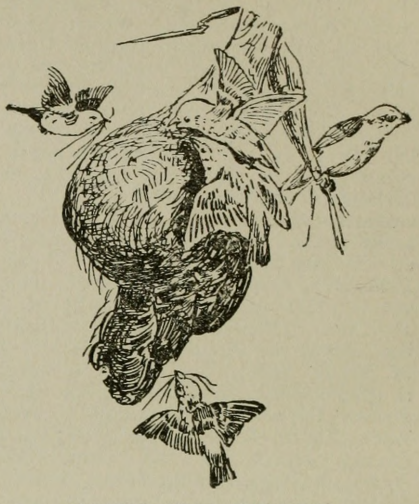
ment of War at Washington, but now a part of the Department of Agriculture. The appointment of official predicters in all countries whose territories are sufficiently well covered by telegraph stations is at once a demonstration of the

revolution that has taken place in our ideas with regard to the utility of meteorology, concerning which science it is only a comparatively few years since prominent astronomers and physicists expressed grave doubts as to the value of the great accumulation of observations, and as to the possibility of developing anything more than a crude and useless guess as to the weather of the forthcoming day.

WEATHER SIGNAL, a signal for indicating weather conditions. Five flags are used by the United States Weather Bureau to indicate the temperature and ordinary conditions of the weather. They are numbered 1 to 5, but some are used in couples to form combinations. No. 1 is a perfect white square and indicates "clear or fair weather." No. 2 is all blue, also square, and its meaning is "rain or snow." No. 3 is a black triangle and is called the "temperature signal." It is always used in combination with either the white or blue square. When placed above the white or blue flag it means that the weather will be warmer, and when below, that it will be colder. When it is omitted altogether, the significance is that the temperature will be stationary. Sometimes three flags are used in combination. For example, when the triangular flag is at the top of the pole, with the white square immediately below it, and the blue square below the white, the signal reads "warmer, fair weather, followed by rain or snow." No. 4 is the "cold wave" signal. It is a white square with a black square in the center of the white. It shows up very clearly, and can never be mistaken for anything else. No. 5 indicates "local rains or showers." It is a square flag, of which the upper half is white and the lower blue. See WEATHER BUREAU.

WEAVER, JAMES B., an American lawyer; born in Dayton, O., June 12, 1833; was admitted to the bar in 1854; served in the Union army during the Civil War, becoming a Brigadier-General of volunteers. After the war he practiced law in Iowa; filled several offices in that State; edited the "Iowa Tribune," published in Des Moines; was a member of Congress in 1879-1881; the Greenback candidate for President of the United States in 1880; again in Congress in 1885-1889; and in 1892 again became a candidate for the presidency, this time on the People's party ticket, receiving 22 electoral votes. He died in 1912.

WEAVER BIRD, a popular name for any species of the family *Ploceidæ*. Both the scientific and trivial names of these birds have reference to the remarkable structure of their nests. The weaver birds are large finches, with somewhat elongated bodies, moderate



WEAVER BIRDS AND NEST

wings, long tails, and very bright coats, the latter often varied in the breeding season.

WEAVING, the art of interlacing yarn threads or other filaments by means of a loom, so as to form a web of cloth or other woven fabric. In this process two sets of threads are employed, which traverse the web at right angles to each other. The first set extends from end to end of the web in parallel lines, and is commonly called the warp; while the other set of threads crosses and interlaces with the warp from side to side of the web, and is generally called the weft or woof. In all forms of weaving the warp threads are first set up in the loom, and then the weft threads are worked into the warp, to and fro, by means of a shuttle. It was by this fundamental process of interlacing two sets of thread in looms of simple mechanism that the mummy cloths of Egypt, the fine damasks and tapestries of the Greeks and Romans, the Indian muslins, the shawls of Cashmere, and the famed textile fabrics of Italy and the Netherlands were produced. From the latter countries weaving by means of a hand loom was introduced into England.

WEBB, ALEXANDER STEWART, an American educator; born in New York City, Feb. 15, 1835; was graduated at the United States Military Academy in 1855; commissioned 2d lieutenant in the 4th Artillery; entered the Civil War

was major of the 1st Rhode Island Infantry, Sept. 14, 1861; served with distinction and was wounded at Gettysburg; was in the Rapidan and Wilderness campaigns; promoted lieutenant-colonel 49th Infantry, July 26, 1866; transferred to the 5th Infantry, March 15, 1869; brevetted Major-General, U. S. V. and U. S. A.; was discharged at his own request, Dec. 3, 1870. He was president of the College of the City of New York from 1869 to 1903, and wrote: "The Peninsula: McClellan's Campaign of 1862." He died in 1911.

WEBB, JAMES WATSON, an American military officer and diplomatist; born in Claverack, N. Y., Feb. 8, 1802. He became a lieutenant in the artillery; was made adjutant in 1825, served for a time under General Scott; resigned from the army, in April, 1827, to take up journalism. He was connected with the "Morning Courier," New York (1827-1829); "The Morning Courier and New York Enquirer" (1829-1859). He was the author of: "Altowan; or, Incidents of Life and Adventure in the Rocky Mountains" (2 vols. 1846); "Slavery and its Tendencies" (1856); and a pamphlet on "National Currency" (1875). He died in New York City, June 7, 1884.

WEBB, SIDNEY, an English socialist, one of the founders of the Fabian Society; born in London, England, July 13, 1859; was educated in Switzerland, Germany, Birkbeck Institute, and City of London College; for some time in the civil service; became a barrister in 1885; lectured on political economy at City of London College, Workingmen's College, and London School of Economics and Political Science. He wrote: "Socialism in England" (1889); "The Eight Hours' Day" (1891), in collaboration with Harold Cox; and "The London Program" (1892). His wife, Beatrice (Potter), wrote: "The Coöperative Movement in Great Britain," and together they wrote the noted "History of Trades-Unionism in England" and "Industrial Democracy" (1898), "Problems of Modern Industry" appeared in 1898; "English Poor Law Policy" in 1910; "The Prevention of Destitution" in 1911.

WEBB CITY, a city of Missouri, in Jasper co. It is on the Missouri Pacific and the St. Louis and San Francisco railroads. It is the center of an important mining region. It is in the lead and zinc district of southwest Missouri, and in the neighborhood of the city are over 200 mining plants. Other industries include a foundry, machine shops, iron works, a flour mill, etc. Pop. (1910) 11,817; (1920) 7,807.

WEBER, CARL MARIA VON (vā'ber), a German composer; born in Eutin, Germany, Dec. 18, 1786. His father was a musician, and had him carefully educated. He learned for a time painting and engraving, but music was his passion, and he began to compose at the age of 12. He made various musical tours with his father, and about 1803 visited Vienna, where he became acquainted with the celebrated Haydn and the Abbé Vogler, from whom he received valuable help in his studies. He had now become widely known, and filled successively the offices of chapel-master at Breslau and Carlsruhe, and director of the opera at Prague, making in the meantime other professional journeys in Germany. At the close of 1816 he settled at Dresden, where he was the founder and director of German opera. In 1822 he went to Berlin, to bring out his "Der Freischütz" (The Free-Archer), the most celebrated of his compositions, and which at once gave him rank with the great masters of his art. In 1826 Weber visited London to superintend the production of his "Oberon," which he had composed for Covent Garden Theater, and was brought out, conducted by Weber himself, April 12, 1826. Soon after, unmistakable symptoms of pulmonary disease presented themselves, and the health of the great composer sank rapidly, and his illustrious career closed on June 5, 1826, when he was found lifeless in his bed. Of his other compositions may be named the operas of "Das Waldmädchen" (The Forest Maiden), recast under the titles of "Sylvana," "Rübezahl," and "Euryanthe."

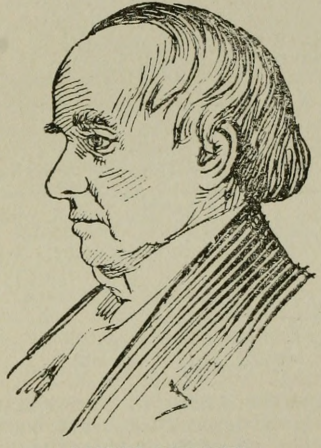
WEBER'S LAW, in physiology, that there is always a constant ratio between the strength of the stimulus and the intensity of the sensations. The stronger the stimulus already applied, the stronger must be the increase of the stimulus in order to cause a perceptible increase of the sensation.

WEBSTER, a city of Massachusetts, in Worcester co. It is on the French river, and on the New York, New Haven, and Hartford and the Boston and Albany railroads. Its industries include woolen mills, stove factories, yarn mills, etc. It has a public library and other public buildings. Pop. (1910) 11,509; (1920) 13,258.

WEBSTER, DANIEL, an American statesman and orator; born in Salisbury, N. H., Jan. 18, 1782. He was a child of the wilderness, and but for our system of school education, which, even then, pushed the means of instruction into remote solitudes, he would never have been enabled to bring his great faculties to

bear in public life. Daniel was the second son of Ebenezer Webster, a small farmer and justice of the county court. He entered Dartmouth College in 1797, and taught school in winter to pay his expenses. He was graduated in 1801, and commenced to study law, but was induced, by an offer of a salary of $350 a year, to become preceptor of an academy at Fryeburg, Me., paying his board by copying deeds. In 1804 he went to Boston, and entered the law office of Mr. Gore. In 1805 he was admitted to the Boston bar, passed one year in the practice of his profession at Boscawen, and, on the death of his father, established himself at Portsmouth, N. H., and married in 1808.

Having engaged in politics as a member of the Federalist party, he was elected to Congress, where he immediately took rank with the foremost men



DANIEL WEBSTER

of the country. He took his seat in the special session of May, 1813, and on June 10 delivered his maiden speech on the repeal of the Berlin and Milan decrees. This, and his mastery of the question of currency and finance, secured him a high position. At the close of the session, however, he removed to Boston, where, during a period of seven years, he devoted himself exclusively to the practice of his profession, and occupied a position as a counsellor and an advocate, above which no one has ever risen in this country. In 1822 he was a member of the Massachusetts Constitutional Convention, and on Dec. 22, 1822, he pronounced at Plymouth, on the anniversary of the landing of the Pilgrims, the first of that remarkable series of discourses, or orations, which put him in the first rank among American orators. In 1829 he delivered an oration at the laying of the corner stone of the Bunker Hill Monument; in 1843 one on its completion. In 1826 he pronounced the eulogy of John Adams and Thomas Jefferson, two fathers and Presidents of the American Republic, who died on the same semi-centenary anniversary of the Declaration of Independence; and in 1851, a patriotic discourse on the laying of the corner stone for the extension of the Capitol at Washington.

In 1822 he was elected to Congress from Boston, and distinguished himself by his speeches on the Holy Alliance, and the Greek revolution, and his labors in the revision of the criminal laws of the United States. In 1826, he was chosen a United States Senator; and in 1830, rose to the height of his forensic renown, in a speech of two days, in the debate with Senator Hayne, of South Carolina, on the right of "nullification." Webster and Clay were the leaders of the opposition during the administration of Jackson and Van Buren. In 1841 he became Secretary of State under President Harrison; remained in the administration of President Taylor till 1843; and was a third time Secretary of State in 1850, in the cabinet of Mr. Fillmore. On various occasions Webster had been an unsuccessful candidate for the presidency. He aspired again to that position in 1852, but his advocacy of compromises on the slavery question had given offense to the Abolitionists, and the choice of the convention assembled at Baltimore fell on Gen. Winfield Scott. The great orator died a few months after, Oct. 24, 1852. Webster's figure was commanding; his countenance was remarkable even in repose, but when animated by the excitement of debate it "spake no less audibly than his words." His gestures were vehement, without being undignified; and his voice was unrivaled in power, in clearness, and in modulated variety of tone. The most complete edition of his works is that published in 1851, in six volumes 8vo.

WEBSTER, HENRY KITCHELL, an American author, born at Evanston, Ill., in 1875. He was graduated from Hamilton College in 1897, and in 1897 and 1898 was an instructor of rhetoric at Union College, Schenectady, N. Y. He wrote "The Short Line War" (with Samuel Merwin, 1899); "The Banker and the Bear"; "The Story of a Corner in Land" (1900); "Calumet 'K'" (with Samuel Merwin, 1901); "Roger Drake, Captain of Industry" (1903); "The Duke of Cameron Avenue" (1904); "Traitor and Loyalist" (1904); "Comrade John" (with Samuel Merwin, 1907); "The Whispering Man" (1908); "A King in Khaki"

(1909); "The Sky Man" (1910); "The Girl in the Other Seat" (1911); "June Madness" (1912); "The Ghost Girl" (1913); "The Butterfly" (1914); "The Real Adventure" (1916); "The Painted Scene" (1916); "The Thoroughbred" (1917); "An American Family" (1918).

WEBSTER, JOHN, an English dramatist of the first part of the 17th century. He was clerk of the parish of St. Andrew, Holborn, and a member of the Company of Merchant Tailors. His works are: "The White Devil" (1612); "The Devil's Law-Case" (1623); "The Duchess of Malfy" (1623); "Appius and Virginia" (1654); "The Thracian Wender" (1661); and "A Cure for a Cuckold," a comedy (1661). He also assisted Dekker in writing the "History of Sir Thomas Wyatt," and the comedies "Westward Hoe!" and "Northward Hoe!" By some critics he is accounted second only to Shakespeare.

WEBSTER, NOAH, an American lexicographer; born in Hartford, Conn., Oct. 16, 1758. He was graduated at Yale College in 1778, having served in the Revolutionary War in his junior year; was admitted to the bar in 1781, but relinquished it for teaching in 1782; and in 1788 settled in New York as a journalist. Thence he removed to New Haven in 1798, and thence to Amherst in 1812, returning to New Haven in 1822. In 1783-1785 he published his "Grammatical Institute of the English Language," in three parts, "Webster's Spelling Book," "A Plain and Comprehensive Grammar," and "An American Selection of Lessons in Reading and Speaking." All these works had an enormous sale. His literary activity was henceforth very great, the works issued by him during the next few years including important legal and linguistic studies. In 1806 he published an 8vo. English dictionary, which led the way for his great work, the "American Dictionary of the English Language." In preparing this work he visited England, and he finished the dictionary during an eight months' residence in Cambridge. In June, 1825, he returned to America. The first edition of his dictionary was published in 1828 (2 vols. 4to.); it was followed by a second in 1840; since which time a number of editions have appeared, and the work has grown into the greatly improved and enlarged "International Dictionary." He died in New Haven, Conn., May 28, 1843.

WEBSTER GROVES, a city of Missouri, in St. Louis co. It is on the St. Louis and San Francisco railroad. It is chiefly a residential suburb of St. Louis and contains several educational institutions and a public library. Pop. (1910) 7,080; (1920) 9,474.

WEDDERBURN, ALEXANDER, a Lord Chancellor of England, ennobled as Lord Loughborough and Earl of Rosslyn; born in Edinburgh, Scotland, Feb. 13, 1733; the son of a Scotch judge. He passed as advocate, but was called to the English bar in 1757. He entered Parliament in 1762, took part in the great Douglas cause, and in 1771 left the opposition to become a strenuous supporter of Lord North as solicitor-general. He supported the American war policy, and was made chief-justice as Lord Loughborough (1780); but in 1784, disappointed of the chancellorship, passed over to Fox, and sought favor with the Prince of Wales. Insinuating and unscrupulous, he next made friends with Pitt, by whom he was made Lord Chancellor (1793), but to whom he played false. Addington gave him his earldom (1801). He died near Windsor, Jan. 2, 1805.

WEDGWOOD, JOSIAH, an English potter; born in Burslem, Staffordshire, England, July 12, 1730. He received little education, and went to work in his brother's factory at the age of 11. An incurable lameness, the result of smallpox, which subsequently compelled him to have his right leg amputated, forced him to give up the potter's wheel. He removed for a time to Stoke, where he entered into partnership with persons in his own trade, and where his talent for ornamental pottery was first displayed. Returning in 1759 to Burslem, he set up a small manufactory of his own, in which he made a variety of fancy articles. His business improving, he turned his attention to white stoneware, and to the cream-colored ware for which he became famous; and he succeeded in producing a ware so hard and durable as to render works of art produced in it almost indestructible. His reproduction of the Portland Vase is famous. He also executed various paintings on pottery without the artificial gloss so detrimental to the effect of superior work. Josiah Wedgewood's numerous improvements in pottery created the great trade of the Staffordshire potteries. He died in Etruria, near Newcastle-under-Lyme, Jan. 3, 1795. See POTTERY.

WEDNESDAY, the name of the fourth day of the week (in Latin, *dies Mercurii*, day of Mercury), derived from the old Scandinavian deity Odin or Woden.

WEED, the name given to each of those plants which grow wild in cultivated grounds, and injure the crops; which they do both by choking them and by exhausting the soil. Those weeds

which are annuals or biennials, as charlock, yellow rattle, and melilot, may gradually be got rid of by merely cultivating, for a succession of years, such plants as are to be cut before the seeds of the weeds are fully ripe. Perennial weeds, such as couch-grass, can only be removed from the ground by repeated and careful tilling; and for this purpose crops which require much hoeing are advantageously planted, and recourse is had to summer fallowing in fields, and frequent weeding in gardens. Thistles and other large weeds are frequently pulled in cornfields before the corn comes into ear, and to prevent their seeding they are cut in pastures. Sedges and rushes, which spring up in great abundance in damp grounds, disappear on thorough draining. Leafy crops which thickly cover the soil prevent the growth of many weeds by the exclusion of air and light. Weeds which have been rooted up form excellent compost for manure. Those which make their appearance in fallow grounds serve for green manuring when they are plowed down. Cultivated grasses growing in arable fields are weeds there. The seeds of weeds are carried normally by the wind, but may be conveyed by running streams.

WEED, THURLOW, an American journalist; born in Cairo, N. Y., Nov. 15, 1797; was employed as a lad in several printing offices; served as a private in the War of 1812; and afterward edited newspapers in western New York, till in 1830 he founded the Albany "Evening Journal," an anti-Jackson, Whig, or Republican paper, which became the organ of the party, and which he controlled for 35 years. He was a leading party manager in State and National politics in 1824-1876, exercising almost supreme influence in nominations and appointments, while declining all offices for himself. He was influential in nominating Harrison in 1836 and 1840, Clay in 1844, Taylor in 1848, and Scott in 1852; with Seward and Greeley controlled New York; supported Lincoln and the Civil War; and went for him on a mission to Europe in 1861-1862. In 1867-1868 he was editor of the New York "Commercial Advertiser." He wrote "Letters from Europe and the West Indies" (1866); "Reminiscences" (in "Atlantic Monthly," 1870); "Autobiography" (1884). He died in New York City, Nov. 22, 1882.

WEED, WALTER HARVEY, an American geologist; born in St. Louis, May 1, 1862; was graduated at Columbia School of Mines in 1883; and was then appointed geologist on the United States Geological Survey. In 1883-1889 he was on the geological survey of the Yellowstone Park. He discovered that colors in hot springs and deposits in geysers are caused by algæ. He also discovered Death Gulch in that park, where bears, elk, etc., are killed by inhaling carbon dioxide gas emitted from an extinct hot spring. In 1889-1898 he was engaged on a general geological exploration of Montana, and made important discoveries. In 1899 he brought out the first published theory of secondary enrichment of ore deposits. He was the author of "Formation of Hot Springs Deposits"; "Laramie and Livingston Formations"; "Glaciation of Yellowstone Park"; "Geology of Castle Mountain District"; "Geology of Bear Paw Mountains"; "Secondary Enrichment of Mineral Veins"; "Ore Deposits"; etc.

WEEHAWKEN, a town in Hudson co., N. J.; on the Hudson river and on the West Shore, and the New York Central, and other railroads; opposite New York City. It contains a public and parochial school, and has two large reservoirs belonging to the Hackensack Water Company. It is said to be the largest coal shipping depot in the United States. Here are the coal docks of the Erie and Pennsylvania Railroad Companies and those of the Delaware and Hudson Canal Company. Weehawken is noted as the dueling ground of Alexander Hamilton and Aaron Burr. Pop.(1910) 11,228; (1920) 14,485.

WEEK, the space of seven days; the space from one Sunday, Monday, etc., to another; the most obvious and convenient division of the natural or lunar month. The division of time into weeks did not exist among the aborigines of America when the New World was discovered, nor did it exist among the Polynesians, the Japanese, or, it is now believed, the Chinese. It is nearly universal in India, and was found thoroughly rooted when the first Christians went to that country. So has it been from a period of high antiquity in Scandinavia, the names of the several days being connected with identically the same planets in the two regions; so that, if at noon on Sunday in Sweden one could be transported in a moment to India, he would find it Aditwar (=Sunday) there, and so of any other day in the week. The Hebrews, and it is thought the other Semites, had the institution of weeks, the days apparently being simply numbered first, second, third, etc. During the early centuries of their history the Greeks and the Romans had not the institution of weeks, there having been ancient forgery in connection with Homer's oft-quoted passages on the subject. Dion Cassius,

in the 2d century after Christ, considered that the week with the planetary names of the days had been introduced into Rome only recently, and from Egypt. The establishment of Christianity under Constantine confirmed the change, and thence the septenary division of time spread to the whole Christian world. The Mohammedans borrowed the week from the Jews, and like them number the days, as do also the Greeks, Slavs, Finns, and as did the French revolutionists, instead of naming them like the Latins, Teutons, and Celts. One school of theologians attributes the wide prevalence of septenary institutions to the Sabbath having been divinely instituted at the Creation; another school again regards the week as a fourth part of a lunar month. Also applied to the week days as opposed to Sundays.

WEEKS, JOHN WINGATE, an American public official, born in Lancaster, N. H., in 1860. He graduated from the United States Naval Academy in 1881 and until 1883 served as midshipman. Resigning from the naval service, he engaged in banking in Boston. He became active in politics and served as mayor of Newton, Mass., and as chairman of the Republican National Convention in 1904. He was elected to the 59th Congress and was re-elected up to and including the 62d Congress. In 1912 he was elected United States Senator, but was defeated for renomination in 1918. He was a member of many patriotic societies. He was appointed Secretary of War by President Harding in March, 1921.

WEEVIL, a popular name for a large number of beetles, marked by the prolongation of the anterior part of the head into a beak or proboscis, generally used by the females as an ovipositor, and by both sexes as a boring organ. They were formerly ranked in one family *Curculionidæ*, but Le Conte constituted them a special group with the title rhynchophora, and divided them into several families—*Curculionidæ*, *Scolytidæ*, *Brenthidæ*, and *Anthribidæ*. According to some authorities there are about 30,000 species; and most would allow at least half that number. With few exceptions the footless grubs are destructive to plants. The *Curculionidæ* are compact weevils, with very hard wing covers, and with a downward-pointing beak or proboscis, bearing the antennæ on its sides and the mouth parts at its end. Their scales are often very brilliant. With few exceptions they devour plants—roots, stems, leaves, fruits, seeds, or, in fact, any part. Large appropriations have been made in recent years to exterminate the boll weevil, which is especially destructive to the cotton plant. Its ravages have caused great losses to the cotton crop.

WEIGHTS AND MEASURES. Of the earliest standards of length the principal were the palm or handbreadth, the foot, and the cubit (from elbow to tip of mid-finger). There were two leading cubits: the natural cubit in Egypt, Chaldea, Phœnicia, and Greece=6 palms=2 spans=1½ foot=18.24 inches; and the royal cubit of Memphis, found also in Babylonia and Chaldea=20.89 inches. The Greek foot (=12.16 inches) passed into Italy and was there divided into 12 unciæ (inches); it was afterward shortened, becoming as small as 11.65 inches. The Romans used a 3-foot ulna. The Saxons used an ell or yard of 36 inches, based on the Roman foot. This was continued by the Normans in England, various modifications occurring in the ell. Henry VII. and Elizabeth made standard yards of 36 inches: Henry's was 35.924 inches of the present standard; Elizabeth's was about 1-100 inch more than the present yard. In 1742 the Royal Society of London made a standard 42-inch scale; in 1760 Mr. Bird made for a Weights and Measures Committee of the House of Commons a copy of an old yard measure found in the Tower. In 1824 (5 Geo. IV. chap. 74) this copy was legalized as the standard yard, with the direction that in the event of its being lost, the standard was to be recovered by making the length of a mean-time seconds pendulum in the latitude of London, in a vacuum at sea-level equal to 39.1393 inches. In 1834 the standard was destroyed in the fire at the Houses of Parliament. In 1838 a committee was appointed under Mr. Airy, astronomer royal; in 1841 they reported against the accuracy of the pendulum method; in 1843 they were appointed as a commission to restore the lost standards; this they did between 1843 and 1854 by taking the best secondary evidence, and they produced a standard bar of gun metal, the distance between two lines on which, crossing two gold studs, is one yard, at 62° F. and 30 inch bar. pressure. This was legalized as the standard by 18 and 19 Vict. chap. 72. The weights and Measures Act of 1878 (41 and 42 Vict. chap. 49) regulates the law, renders all old local or customary weights and measures, other than imperial ones, illegal, and enacts penalties on false and unverified weights and measures varying from $25 to $250.

Two-thirds of a cubit, we have seen, made a "foot"; a "cubic foot" of water

weighed a talent. When the "foot" was 2-3 the royal cubit, the talent was 655,-566 grains; this was the Egyptian, Hebrew, and Olympic monetary talent, later known as the great Alexandrian talent of brass and the Egypto-Roman talent. A talent half this weight was known as the Alexandrian talent of silver, or 327,783 grains; this was divided into 60 minas of 5,463 grains each; these are the origin of the Saxon moneyer's pound of 5,400 grains=Mint pound or Tower pound=old apothecaries pound of Germany; one such pound, in silver coins, was the original form of "one £ sterling," and was divided into 20 "shillings," or 240 "pence" or pennyweights; each pennyweight was divided into 32 monetary grains (wheat grains), each equal to 0.703125 modern grain. The Tower weight was abolished in 1527. The Saxon ounce contained 416.5 grains =nearly, Roman uncia=1-12 libra; the libra (=5,015 grains) was the Greek-Asiatic and Persian mina of 5,015 grains. The Troy pound is 5,760 grains =12 ounces of 20 pennyweights each. Troy weight is now restricted to gold, silver, and jewels, except diamonds and pearls; the latter are weighed in carats (=3.1683 grains), which were originally $\frac{1}{144}$ the Alexandrian ounce (the twelfth part of the mina of silver). Various larger pounds were early used for merchandise; in 1303 the "avoirdupois" pound (=7,000 grains) was in use. The Troy pound standard made by Mr. Bird in 1758 for the Weights and Measures Committee was legalized in 1824; in 1834 the standard was destroyed; the Standards Commission replaced troy weight by avordupois, and the standard pound is a mass of platinum weighing 7,000 grains *in vacuo*, copies of which are distributed as in the case of standards of length. The standard of capacity is the gallon, which was in 1824 adjusted so as to contain 70,000 grains, or 10 pounds avoirdupois of water at 62° F. and 30 inches bar. pressure; this gallon occupying 227.274 cubic inches, instead of the old Winchester gallon of 274¼ cubic inches. The French or metric system of weights and measures is based on the decimal system. (See METRIC SYSTEM.) The metric system was legalized in the United States on July 28, 1866, when Congress enacted as follows:

The tables in the schedule hereto annexed shall be recognized in the construction of contracts, and in all legal proceedings, as establishing, in terms of the weights and measures now in use in the United States, the equivalents of the weights and measures expressed therein in terms of the metric system, and the tables may lawfully be used for computing, determining, and expressing in customary weights and measures the weights and measures of the metric system.

The following are the tables annexed to the above:

Metric Denominations and Values.		Equivalents in Denominations in Use.
Myriameter	10,000 meters.	6.2137 miles.
Kilometer	1,000 meters.	0.62137 mile, or 3,280 feet 10 inches.
Hectometer	100 meters.	328 feet 1 inch.
Dekameter	10 meters.	393.7 inches
Meter	1 meter.	39.37 inches.
Decimeter	1-10 of a meter.	3.937 inches
Centimeter	1-100 of a meter.	0.3937 inch.
Millimeter	1-1000 of a meter.	0.0394 inch.

MEASURES OF SURFACE.

Metric Denominations and Values.		Equivalents in Denominations in Use.
Hectare	10,000 square meters	2.471 acres.
Are	100 square meters.	119.6 square yards.
Centare	1 square meter.	1,550 square inches.

MEASURES OF CAPACITY.

Metric Denominations and Values.			Equivalents in Denominations in Use.	
Names.	Number of Liters	Cubic Measure.	Dry Measure.	Liquid or Wine Measure.
Kiloliter or stere..	1,000	1 cubic meter.....	1,308 cubic yards....	264.17 gallons.
Hectoliter.....	100	1-10 of a cubic meter....	2 bush. and 3.35 pecks	26.417 gallons.
Dekaliter.....	10	10 cubic decimeters.....	9.08 quarts.....	2.6417 gallons.
Liter.....	1	1 cubic decimeter.....	0.908 quart.....	1.0567 quarts.
Deciliter.....	1-10	1-10 of a cubic decimeter	6.1022 cubic inches..	0.845 gill.
Centiliter.....	1-100	10 cubic centimeters....	0.6102 cubic inch....	0.338 fluid oz.
Milliliter.....	1-1000	1 cubic centimeter.....	0.061 cubic inch.....	0.27 fluid dram.

WEIGHTS.

Metric Denominations and Values.			Equivalent in Denominations in Use
Names	Number of Grains	Weight of What Quantity of Water at Maximum Density	Avoirdupois Weight.
Miller or tonneau	1,000,000	1 cubic meter	2204.6 pounds.
Quintal	100,000	1 hectoliter	220.46 pounds.
Myriagram	10,000	10 liters	22.046 pounds.
Kilogram or kilo	1,000	1 liter	2.2046 pounds.
Hectogram	100	1 deciliter	3.5274 ounces.
Dekagram	10	10 cubic centimeters	0.3527 ounce.
Gram	1	1 cubic centimeter	15.432 grains.
Decigram	1-10	1-10 of a cubic centimeter	1.5432 grains.
Centigram	1-100	10 cubic millimeters	0.1543 grain.
Milligram	1-1000	1 cubic millimeter	0.0154 grain.

WEI-HAI-WEI (wī-hī-wī), a port of north China, on the Shantung promontory; about 40 miles E. of Chefoo and 115 miles S. E. of Port Arthur. The harbor, about 18 miles in circumference, is deep, and is sheltered on the N. by the small island of Liu-Kung. The port, formerly a Chinese naval station, was captured by Japan in her war with China in 1895, the land forts being taken Jan. 30 and the island Feb. 7. Admiral Ting, who had supported the forts with the Chinese fleet, offered terms of surrender that were accepted, but he committed suicide, his example being followed by Commodore Liu and the commander of the military garrison, and the Japanese took possession of the fortifications. After destroying the land defenses they withdrew leaving a garrison on the island. Their occupation was only temporary. By a convention signed at Peking, July 1, 1898, Wei-hai-wei was leased to Great Britain as an offset to the concessions granted to Russia in the Liaotung peninsula, the period of occupation to be determined by that of Russia at Port Arthur. In 1905 when Japan took over the lease the British lease was made to run as long as the Japanese occupied Port Arthur.

WEIMAR (vī'mär), a small but interesting town of Germany; capital of the former grand-duchy of Saxe-Weimar-Eisenach, and former residence of the grand-duke; 31 miles E. of Gotha and 155 S. W. of Berlin. It stands in a pleasant valley on the left bank of the Ilm; the environs are in no way remarkable, and the town itself is irregularly and poorly built. Though formerly the residence of the court, Weimar carries on neither trade nor manufactures, and seems a dull, provincial-looking town. The luster conferred on it by the residence here, at the close of the 18th and earlier portion of the 19th century, of Goethe, Schiller, Herder, and Wieland, at the court of Karl-August, has faded since that group was broken up by death; and now the interest of the place (Thackeray's "Pumpernickel") is almost wholly derived from its monuments, traditions, and associations. The town church (Stadtkirche), dating from the year 1400, has a "Crucifixion" by Cranach, and contains a number of memorable tombs, among which are those of Bernhard of Weimar and Herder. The ducal palace, rebuilt in 1790-1803 after the fire of 1774, is a handsome building, some of the apartments of which are decorated by frescoes illustrating the works of Goethe, Schiller, Herder, and Wieland. Other buildings are the Rothes Schloss (1574); the Grünes Schloss, with a library of 180,000 volumes, and relics of Luther and Gustavus Adolphus; the court theater (rebuilt 1825), where Liszt produced Wagner's "Lohengrin"; and the houses of Cranach, Goethe, Schiller, and Herder. The park and gardens of the palace, within which is the summer residence of Goethe, are much esteemed as a promenade. In Weimar in 1919 was held the National Assembly which formulated a new constitution for the German Republic. (See GERMANY). Pop. about 35,000.

WEINGARTNER, FELIX, an Austrian composer; born in Zara, Dalmatia, June 2, 1863. At Graz he studied under Dr. W. Mayer, and at Leipsic, in 1881, obtained a scholarship from the Austrian Government. At Franz Liszt's instigation his opera, "Sakuntala," was brought out at Weimar on March 23, 1884. From 1884 to 1889 he was conductor at Königsberg, Danzig, and Hamburg, and in 1891 was appointed court conductor at Berlin. In 1906 he made his first visit to the United States, and during the season 1912-1914 he conducted the Wagnerian performances for the Boston Opera Company. He composed several symphonic poems and operas, and many songs.

WEISSENBURG (vī'sen-börG), a town of France; in the province of Alsace; at the foot of the Vosges Moun-

tains; on the Lauter; 34 miles N. N. E. of Strassburg. In the Franco-Prussian War of 1870-1871 a battle took place here on Aug. 4, 1870, the first important engagement between the two armies, in which the French were defeated. Pop. about 7,000.

WELBECK ABBEY, the seat of the Duke of Portland, in Nottinghamshire, England; 3 miles S. of Worksop. Occupying the site of an old Premonstratensian abbey, it came from "Bess of Hardwick" to her son Sir Charles Cavendish, the father of the 1st Duke of Newcastle, whose far-away heiress married in 1734 the 2d Duke of Portland. It stands in a park 10 miles in circumference, and is a stately Palladian edifice of mainly the 17th and 18th centuries, but was greatly enlarged about 1864 by the 5th duke, to whom it owes its semi-underground picture gallery, ballroom, and riding school, the last 385 feet long, 104 feet wide, and 51 feet high.

WELCH, WILLIAM HENRY, an American pathologist, born in Norfolk, Conn., in 1850. He graduated from Yale in 1870, and from the College of Physicians and Surgeons in 1875. He carried on post-graduate courses in Germany, and in 1879 became professor of pathological anatomy and general pathology at Bellevue Hospital Medical College. He practiced in this post until 1884, when he was appointed Baxley professor of pathology at Johns Hopkins University. Here he served until 1916, for several years also occupying the post of dean of the medical faculty. In the latter year he was director of the School of Hygiene and Public Health of Johns Hopkins University. He was also president of the Maryland State Board of Health, and president of the board of directors of the Rockefeller Institute for Medical Research from 1901. From 1906 he was a trustee of the Carnegie Institution. He lectured at the Charing Cross Hospital in London and in other hospitals. He was a member of many American and foreign medical societies, wrote "General Pathology of Fever" (1880); "Bacteriology of Surgical Infections" (1895); "Thrombosis and Embolism" (1899), and contributed many articles to medical magazines.

WELFARE WORK. During the World War great impetus was given to welfare work in the United States as well as in other countries. The term, while of wide application, has in practice been applied in the main to the efforts made by employers to improve the working and living conditions of those in their employ. It has resulted in a great deal of attention being given to matters touching on the health of the working people, such as food and housing, as well as to the environment amid which their work is performed. The methods adopted to improve conditions have included rearrangements and improvements of lighting and heating and atmospheric conditions, and the shortening of the working day. To these have been added the establishment of facilities for recreation and refreshment, as well as lavatories and rest rooms. Where a large view has been taken of the obligations of the employer, and in communities which are small enough, an effort has been made to provide entertainment and occupation even outside of the hours of work. Club houses have been established, teams for various sports have been made up, playgrounds have been provided, recreational groups have been formed with facilities in chosen lines, there has been attention given to the housing of the workers, to nursing and medical attention, the promotion of gardening, premiums to stimulate rivalry in the care of the home and its environs, the institution of flower gardens, and numerous other activities warranted by local conditions and the desires of the working people themselves.

It was seen in the course of the war what opportunities in this line had been opened by the great powers with which the administration had been intrusted, and a great deal of work in that direction was done in the industries under the control of the Government. The housing problem received marked attention, and emergency hospitals were established and visiting nurse work developed. Statistics compiled by the Government showed that among private industrial establishments over one-third were active in social betterment work among the families of the workers. Playgrounds, visiting nurses, domestic science classes, systems of charitable relief and the like were in vogue in connection with many of these establishments. The work in the United States was only a reflex of similar work done in various countries of Europe, and developed under the influences of the war. In Germany welfare work has been developed on lines so remarkable that the factory portion of a town in a German city is often the most beautiful part of it. Welfare work in connection with large industrial establishments has also been greatly developed in Great Britain, and there, as in other countries, new activities in that direction were opened up by the great expansion in certain lines of industry during the war.

WELLAND CANAL, a ship canal in Ontario, Canada, extending from Port Colborne, on Lake Erie, to Port Dahousie on Lake Ontario, a distance of 27 miles, It was opened to travel in 1833. In 1913 the construction of a new canal was begun, with a width of 200 feet and a depth of 25. The estimated cost was over $30,000,000.

WELLES, GIDEON, an American statesman; born in Glastonbury, Conn., July 1, 1802; studied law; and in 1826 became proprietor of the Hartford "Times." In 1861 he was appointed by President Lincoln Secretary of the Navy, and filled that office with marked success and credit during the whole of the Civil War. After his retirement he published his "Memoirs of the War." He died in Hartford, Conn., Feb. 11, 1878.

WELLESLEY (welz'li), **RICHARD COLLEY, VISCOUNT AND MARQUIS**, and Earl of Mornington, eldest son of Garrett, 1st Earl of Mornington, and eldest brother of the Duke of Wellington; a British statesman; born in Dublin, Ireland, June 20, 1760. He was educated at Eton and Oxford. On his majority he took his seat as Earl of Mornington in the Irish House of Peers, and three years after was returned to the British House of Commons as member for Beeralston. Thus, by a curious anomaly, he was at once a peer and a commoner. He distinguished himself in 1789 in the debates on the regency question. In this discussion, his defense of the royal prerogative, made known to George III. after his recovery, pleased him so much that the earl at the next general election was returned for Windsor, and made a member both of the Irish and the English privy-council. These were only preliminaries to the higher appointment of Governor-General of India, which was conferred on him in 1797, along with a British peerage under the title of Baron Wellesley. His administration forms an era in the history of the British Indian empire. He returned to England in 1805, and in 1809 became foreign secretary under Mr. Perceval. In 1812 he resigned his place, chiefly because he was in favor of Catholic emancipation. He did not return to office till 1821, when he became Lord-Lieutenant of Ireland. This post he retained till 1827. In the Grey ministry he again (1833) became Lord-Lieutenant of Ireland, but finally retired from public life in 1835. He died in London, Sept. 26, 1842.

WELLESLEY COLLEGE, an American educational institution established in 1875 in the village of Wellesley, Mass., 15 miles S. W. of Boston. The institution is devoted entirely to the higher education of women. The institution is non-sectarian, and was founded by Henry F. Durant, of Boston. The reports for 1919 show: Professors and instructors, 192; students, 1,592; president Ellen F. Pendleton, LL. D.

WELLESLEY ISLANDS, a group in the Gulf of Carpentaria, Australia, belonging to Queensland. Mornington Island, the most N. and largest, is 40 miles in length by 15 in breadth.

WELLINGBOROUGH, a market-town of Northamptonshire, England, on a declivity near the confluence of the Ise with the Nen, 10½ miles E. N. E. of Northampton. Almost destroyed by fire in 1738, it has a chalybeate spring (the "Red Well"), said to have been resorted to by Charles I. and Henrietta Maria; a large and imposing parish church (restored 1861-1874), mainly Decorated and Perpendicular in style; a corn exchange (1861); a grammar school (1595), transferred to new buildings in 1880. It has important industries of boot making, iron smelting, etc. Pop. about 20,000.

WELLINGTON, a city and capital of New Zealand, on Port Nicholson, an islet of Cook's Strait; on the S. W. extremity of the provincial district of Wellington, North Island. Its harbor is 6 miles long and 5 wide. It has an excellent system of docks. The principal buildings are the Government House, the Houses of Legislature, the Government Buildings, the Supreme Court, the post and telegraph offices, the Colonial Museum, theaters, Wellington College, two cathedrals, Victoria College, etc. It has several daily and weekly newspapers, botanic gardens, tramways, etc., and is lighted by electricity. Pop. about 100,000.

WELLINGTON, a city of Kansas, the county-seat of Sumner co. It is on the Chicago, Rock Island and Pacific, and the Atchison, Topeka and Santa Fe railroads, and is the center of an important agricultural community with a large trade in grain, live stock, and farm products. Its industries include flour mills, grain elevators, a broom factory, an ice plant, and railroad shops. It has a public library, city hall, court house, and other public buildings. Pop. (1910) 7,034; (1920) 7,048.

WELLINGTON, ARTHUR WELLESLEY, DUKE OF, a British general and statesman; born in Dublin, Ireland, April 30, 1769; the third son of the 1st Earl of Mornington; was educated at

Eton, at Brighton, and finally at the Military College of Angers. In 1787 he received a commission as ensign in the 73d Foot, and after a rapid series of changes and promotions, attained by purchase in 1793 the command as lieutenant-colonel of the 33d Regiment. During 1794 and 1795 he served with his regiment under the Duke of York in Flanders. In 1796 his regiment was dispatched to Bengal, Colonel Wellesley landing at Calcutta in February, 1797, at a critical moment for the British power in India. War had just been declared against Tippoo Sahib, and an army of 80,000, of which Colonel Wellesley's regiment formed part, marched against him. An engagement took place at Mallavelly (Mysore) on the 27th, in which Wellesley, who commanded the left wing, turned the right of the enemy. He was subsequently employed to dislodge the enemy from their posts in front of Seringapatam, and after the capture of that capital he was appointed in 1799 to the administration of Mysore, his brother being at this time governor-general (see WELLESLEY).

In 1802 he attained the rank of Major-General, and in the following year he was appointed to the command of a force destined to restore the Peishwa of the Mahrattas, driven from his capital by Holkar. After this operation had been successfully performed the other Mahratta chiefs, Scindia and the Rajah of Berar, showed hostile designs against the British, and Wellesley was appointed to the chief military and political command in the operations against them. After an active campaign, in which he took Ahmednuggur and Arungabad, he encountered a powerful Mahratta army, assisted by French officers, at Assaye, Sept. 23, and entirely defeated it. The parallel successes of General Lake, and the defeat of the Rajah of Berar by Wellesley at Argaum, Nov. 29, compelled the submission of the Mahrattas, and peace was restored on conditions drawn up by the successful general.

Early in 1805, his health failing, Wellesley obtained leave to return home, and arrived in England in September. He had before leaving Madras received his appointment as Knight Commander of the Bath. From November to February he was engaged as Brigadier-General in Lord Cathcart's expedition to the Continent, which was without result. In January, 1806, he succeeded Lord Cornwallis as colonel of his own regiment, the 33d. On April 10, 1806, he married Lady Catherine Pakenham, third daughter of the Earl of Longford. He was shortly afterward elected M. P. for Rye, and in April, 1807, was appointed secretary of state for Ireland. In August he received the command of a division in the expedition to Copenhagen under Lord Cathcart and Admiral Gambier, and took Kioge on April 29, the only land operation of importance. On April 28, 1808, he attained the rank of Lieutenant-General, and in June received the command of a force destined to operate in the N. of Spain and Portugal. He was subsequently superseded; but before giving up the command he gained the battle of Vimeira over Junot, the campaign having been brought to a close with the convention of Cintra, by which the French agreed to evacuate Portugal.

In 1809 Wellesley was appointed to take the chief command in the Peninsula, which had been overrun by the French. The famous passage of the Douro, and the defeat of Soult which followed, fittingly opened this masterly campaign. For the victory at Talavera (July 28), the first of a long list that subsequently took place in the Peninsula, the government raised the Commander-in-Chief to the peerage as Viscount Wellington. Toward the end of 1810 Wellington fought the battle of Buraco, which was followed by the famous fortification and defense of the lines of Torres Vedras. A little later (in 1811) occurred the victory of Fuentes de Onoro. In the following year he took Ciudad Rodrigo and Badajoz by storm, and fought the battle of Salamanca, accounted one of his most famous victories. On August 12, 1812, Wellington entered Madrid. For his brilliant conduct of the campaign thus far he received the thanks of Parliament, was raised to the dignity of marquis, and a sum of $500,000 was voted to purchase him an estate. Next followed the battle of Vittoria (June 21, 1813), for which decisive victory Wellington was given the baton of Field-Marshal; then battles in the Pyrenees, the capture of San Sebastian and the crossing of the Bidassoa into France. In 1814 the battle of Orthez was gained, and in the same year the battle of Toulouse, in which Soult's best troops were routed, and the hopes of France in the Peninsula utterly annihilated. The way was now open for the British troops to the heart of France. In six weeks, with scarcely 100,000 men, Wellington had marched 600 miles, gained two decisive battles, invested two fortresses, and driven 120,000 veteran troops from Spain.

Napoleon abdicated on April 12, and a few days later the war was brought to a close by the signing of conventions

with Soult and Berthier. In May the triumphant general was created Marquis of Douro and Duke of Wellington, with an annuity of $50,000, commuted afterward for $2,000,000. He received the thanks of both Houses of Parliament. In July he went as ambassador to France, and succeeded Lord Castlereagh as British representative in the Congress of Vienna. In April he took command of the army assembled in the Netherlands to oppose Napoleon (see FRANCE: NAPOLEON I.: WATERLOO, BATTLE OF). On his return to England after the restoration of peace he received a vote of $1,000,000 for the purchase of the estate of Strathfieldsaye, to be held on presenting a colored flag at Windsor on the 18th of June each year.

With the return of peace he resumed the career of politics. He accepted the post of master-general of the ordnance with a seat in the cabinet of Lord Liverpool in January, 1819. In 1822 he represented Great Britain in the Congress of Vienna. In 1826 he was appointed high-constable of the Tower. On Jan. 22, 1827, he succeeded the Duke of York as Commander-in-Chief of the forces. On Jan. 8, 1828, he accepted the premiership, resigning the command of the forces to Lord Hill. In January, 1829, he was appointed governor of Dover Castle, and lord warden of the Cinque Ports. In 1830 repeated motions for parliamentary reform were defeated, but the growing discontent throughout the country on this subject and a defeat in Parliament caused the resignation of the government in November. His opposition to reform made the duke so unpopular that he was assaulted by the mob June 18, 1832, and his life endangered. He accepted office under Sir Robert Peel in 1834-1841, and again in 1846, when he helped to carry the repeal of the corn laws, which till then he had opposed. In 1842 he resumed the command of the forces on the death of Lord Hill. He died in Walmer Castle, Sept. 14, 1852.

WELLS, a city in Somerset, England; at the foot of the Mendip Hills; 20 miles S. W. of Bath and 20 miles S. of Bristol. Here, near St. Andrew's Well, from which and other springs the place took its name, King Ina in 1704 established a house of secular canons; but the see was first founded in 909 by Edward the Elder, and the city has grown up round the cathedral. The see was translated to Bath during the first half of the 12th century, and still is styled Bath and Wells, though Bath's connection has been purely titular since the Reformation. Among its 70 bishops have been Jocelin (1206-1242), the "second founder" of the cathedral, Fox, Wolsey, Barlow, Laud, and Ken. That cathedral, though one of the smallest yet perhaps the most beautiful of English cathedrals, is mainly Early English in style, and is 371 feet long, by 123 across the transept, while the height of the central tower is 160 feet, of the two W. towers 130. Other buildings, all of extreme interest, are the moated episcopal palace, with an undercrypt of about 1220; the deanery, rebuilt by Dean Gunthorpe in the reign of Edward IV.; the archdeaconry, now remodeled as a theological college; the gateways and St. Cuthbert's Church, with a noble W. tower. It was chartered by King John in 1202. Pop. about 5,000.

WELLS, DAVID AMES, an American political economist; born in Springfield, Mass., June 17, 1828; was graduated at Williams College in 1847, and at the Lawrence Scientific School in 1851; and became assistant professor in the latter institution. In 1866 he was made the chairman of a commission to devise the best means to raise money for the government; in 1866-1870 was a special commissioner of revenue; and in 1879 was appointed a member of the Board of Arbitration for Railroads. His publications include: "Our Burden and Our Strength" (1864); "The Creed of the Free Trader" (1875); "Why We Trade and How We Trade" (1878); "The Silver Question, or the Dollar of the Fathers *vs.* the Dollar of the Sons" (1878); "Our Merchant Marine; How it Rose, Increased, became Great, Declined, and Decayed" (1882); "Relation of Tariff to Wages" (1888); etc. He died in Norwich, Conn., Nov. 5, 1898.

WELLS, HERBERT GEORGE, an English novelist; born in Bromley, Kent, England, Sept. 21, 1866; was educated at the Royal College of Science, London. Starting as a teacher in London, he became a journalist there. He wrote: "The Time Machine" (1895); "Select Conversations with an Uncle" (1895); "The Wonderful Visit" (1895); a humorous satire; "The Island of Dr. Moreau" (1896); "The Wheels of Chance" (1896); "Thirty Strange Stories" (1897); "The Invisible Man" (1897); "The War of the Worlds" (1898); "Tales of Space and Time" (1899); "Love and Mr. Lewisham" (1900); "Tono Bungay" (1909); "History of Mr. Polly" (1910); "The World Set Free" (1914); "The Research Magnificent" (1915); "Mr. Britling Sees It Through" (1916); "The Soul of a Bishop" (1917); "Joan and Peter" (1918); "Outline of History" (1920). Wells

several times visited and lectured in the United States. In 1920 he went to Russia as the guest of the Soviet Government, and recorded his impressions, which were, for the most part, favorable.

WELLSVILLE, a city of Ohio, in Columbiana co. It is on the Pennsylvania railroad, and on the Ohio river. It is an important industrial center and has manufactures of steel, terra-cotta, boilers, nails, machinery, etc. Pop. (1910) 7,769; (1920) 8,849.

WELSBACH LIGHT, an invention of Carl Auer von Welsbach, an Austrian, in 1884. In Europe it is known as the Auer light. It is based upon the discovery that certain materials become incandescent at a low temperature. The process followed is to saturate a combustible filament in the form of a network with a solution of salt of a refractory earth, such as zirconium. It is then dried out and burned, the combustible element disappearing and leaving a frame of refractory material, which becomes incandescent at a low temperature. The filament is called a mantle and is exceedingly fragile.

WENCESLAUS, or **WENZEL**, an Emperor of Germany and King of Bohemia; born in 1361; was the son of Charles IV., whom he succeeded in 1378. He was a dissolute and cruel prince. He favored the Hussites, but was unable to save the life of Huss. He died in 1419.

WENDS, the name of a section of the Slavonic race, now dwelling mostly in that part of Germany known as Lusatia, partly in Prussia, partly in the kingdom of Saxony. In the 6th century the Wends were a powerful people, extending along the Baltic, from the Elbe to the Vistula, and S. to the frontiers of Bohemia. They comprised a variety of tribes. The favorite occupation of the Wends was, and still is, agriculture. There are several dialects of the Wend language still extant.

WENER (vā′ner), the largest lake of Sweden, and after those of Ladoga and Onega the largest in Europe; situated in the S. W. of the kingdom. It is 147 feet above sea-level, and of very irregular shape. Its greatest length, N. E. to S. W., is about 100 miles; and its breadth may average about 30 miles; area, 2,306 square miles. Its chief feeder is the Klar. By a canal it communicates with Lake Wetter, but its only proper outlet is at its S. W. extremity, where its superfluous waters are received by the river Gotha. In winter it is frozen for several months, and crossed by sledges. It abounds with fish.

WEREWOLF, or **MAN-WOLF**, the same as the French *loup-garou*, an imaginary being believed in during the Middle Ages.

WERNIGERODE, a town of Prussia, province of Sachsen; on the slopes of the Harz Mountains, at the confluence of the Zilligerbach and the Holtzemme; 40 miles S. W. of Magdeburg. It has a beautiful "schloss" containing a library of 100,000 volumes, specially rich in collection of Bibles and hymnologies, a gymnasium, three churches, a rathhaus dating from the 14th century, and built, as are also many of the private houses, in a picturesque Gothic style, a thiergarten or park, an orphanage, etc. Wernigerode has manufactures of linen, cloth, tobacco, and bricks. Pop. about 20,000.

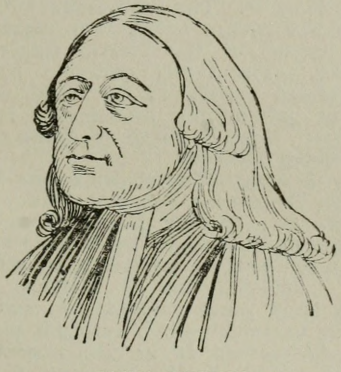
WERRENRATH, REINALD, an American singer, born in Brooklyn, in 1883. He graduated from New York University in 1905. After studying music under several instructors he appeared as a concert singer with marked success in recitals and oratories in the United States. In 1919 he made his first appearance on the operatic stage at the Metropolitan Opera House, New York.

WESER (vā′zer), a river of Germany; formed by the junction of the Fulda and Werra at Münden; flows generally in a N. W. direction, and, after a very circuitous course, traverses the city of Bremen, and then falls by a wide mouth, much encumbered with sandbanks, into the German Ocean. Its length, including the Werra, is about 430 miles. The navigation for vessels of large size ceases about 10 miles below Bremen. See BREMEN.

WESLEY, CHARLES, an English hymnist; born in Epworth, England, Dec. 18, 1707; younger brother of John Wesley; educated at Westminster School and Christ Church, Oxford. He accompanied his brother to Georgia as an ordained clergyman, but after his return to England he became, in 1738, a preacher in the Methodist connection, and materially assisted the success of the movement by his numerous hymns, large collections from which have been frequently published. Two of his sons, CHARLES and SAMUEL, were celebrated for musical genius. He died in London, March 29, 1788.

WESLEY, JOHN, an English clergyman; founder of Methodism; born in Epworth, England, June 17, 1703, son of the rector of Epworth; educated at the Charter House, and at Christ Church, Oxford. He took his degree of B. A. in 1724, was ordained deacon in 1725, be-

came a fellow of Lincoln College, and lecturer and moderator in classics in 1726; and took priest's orders in 1728. He now gathered together a number of pupils and companions who met regularly for religious purposes, and by so doing acquired the name of Methodists. Among these companions were Hervey, Whitefield, and Law. In 1735 Wesley accepted an invitation from General Oglethorpe to go to America to preach to the colonists of Georgia. After a stay of two years he returned to England (February, 1738), and in the following May an important event took place in his inner religious life, namely, his conversion. In June he paid a visit to Herrnhut, the Moravian settlement, returning to England in September. Early in the following year (1739) he began open-air preaching, in which he was for a time associated with Whitefield. His first chapel was built in Bristol in 1739.



JOHN WESLEY

Having now the sole control of the religious body which adhered to him, he devoted his entire life without intermission to the work of its organization, in which he showed much practical skill and admirable method. His labors as an itinerant preacher were incessant. He would ride from 40 to 60 miles in a day. He read or wrote during his journeys, and frequently preached four or five times a day. He held strongly to the principle of Episcopacy, and never formally separated from the Church of England. His collected works were published after his death in 32 volumes 8vo. He contributed to the collection of hymns, the greater part of which were written by his brother Charles. He died in London, March 2, 1791.

WESLEY, SAMUEL, SR., an English clergyman; born in Winterborne-Whitchurch, England, in 1662. He was the father of CHARLES, JOHN, and SAMUEL, JR. He wrote "Life of Christ: An Heroic Poem," Eupolis' Hymn to the Creator," etc. He is best known by the two hymns to be found in Methodist hymn books, "Behold the Saviour of Mankind," and "O Thou who when I did Complain." He died in Epworth, April 25, 1735.

WESLEYAN METHODISM, the largest and most important British Methodist denomination, and the parent of some smaller religious bodies now independent of its government.

WESLEYAN UNIVERSITY, a coeducational institution in Middletown, Conn. In 1830 the original buildings, North College and South College, which had been erected for a military academy, came into the possession of the New York and New England Conferences of the Methodist Episcopal Church; in 1831 a charter was obtained, and the university opened its doors and offered its services to aid in the training of students, who hitherto had been obliged to seek outside their Church the advantages of higher education. In 1872 the institution was opened to women. It has commodious buildings beautifully situated, a fine observatory, well-appointed laboratories and cabinets, and a large modern gymnasium. It reported at the close of 1919: Professors and instructors, 53; students, 595; volumes in the library, 114,000; president, William Arnold Shanklin, L. H. D., LL. D.

WESSEX (WEST SAXONS), one of the most important of the Anglo-Saxon kingdoms in England during the 6th, 7th, and 8th centuries, and the early part of the 9th, and that in which the other kingdoms were ultimately merged in the reign of Egbert in 827. It included the present counties of Devon, Dorset, Somerset, Wilts, Hants, Berks, and a part of Cornwall.

WEST, BENJAMIN, an American painter; born in Springfield, Pa., Oct. 10, 1738, of Quaker parents. After several years of portrait painting in Lancaster, Philadelphia, and New York City, he went to Rome, Italy, in 1760, and proceeded to England in 1763, where he made his permanent residence. One of his earliest friends was Dr. Drummond, Archbishop of York, who introduced him to George III., by whose order he executed his picture of "The Departure of Regulus from Rome," and whose patronage he enjoyed for about 40 years. On the death of Sir Joshua Reynolds, in 1792, West, who had been a member of the Royal Academy from its foundation, was elected president; which chair he enjoyed, with the exception of a short interval, till the close of his life. His

"Death of General Wolfe" was among the first of his productions that attracted public notice, especially for the rational innovation on which he had ventured in it, of painting historical personages in a modern dress. Among his later works were "Death on the Pale Horse," and "Christ Healing the Sick." There is in the Pennsylvania Hospital, in Philadelphia, a copy (with some alterations) of "Christ Healing the Sick," which was presented to it by West. He died in London, March 11, 1820.

WEST ALLIS, a city of Wisconsin, in Milwaukee co. It is on the Chicago, Milwaukee and St. Paul, and the Chicago and Northwestern railroads. It is an industrial suburb of Milwaukee, and has an automobile factory, and manufactories of machinery, wheelbarrows, trucks, sashes, doors, blinds and other manufactures. Pop. (1910) 6,645; (1920) 13,745.

WEST BROMWICH, a parliamentary, municipal and county borough of Staffordshire, England; one of the most important towns in the great manufacturing and mining district known as the "Black Country," 5½ miles N. W. of Birmingham. The seat in the 12th century of a Benedictine priory, it yet is of modern growth, having risen within the last 100 years from a mere village on a barren heath, in consequence mainly of the rich coal and iron mines in the vicinity, of the industries to which these give rise, and of the transport facilities by rail and canal. The manufactures comprise all departments of Birmingham hardware. Puddling and sheet-iron rolling, sheet-glass making, coal mining, and brick and tile making are also carried on to a great extent. Pop. about 70,000.

WESTBROOK, a city of Maine, in Cumberland co. It is on the Boston and Maine and the Maine Central railroads. Its industries include the manufacture of paper, brick, and silk. Pop. (1910) 8,281; (1920) 9,453.

WEST CHESTER, a borough and county-seat of Chester co., Pa.; near the Brandywine river, and on the Philadelphia, Wilmington, and Baltimore, and the Pennsylvania railroads; 27 miles W. of Philadelphia. Here are a court house, State Normal School, Darlington Female Seminary, Villa Marie Convent, county hospital, public library, waterworks, street railroads, electric lights, National and private banks, and several daily and weekly newspapers. The borough has a print establishment, cold-storage works, creamery, and manufactures wheels, carriages, hosiery, toys, artificial ice, umbrellas, etc. Pop. (1910) 11,767; (1920) 11,717.

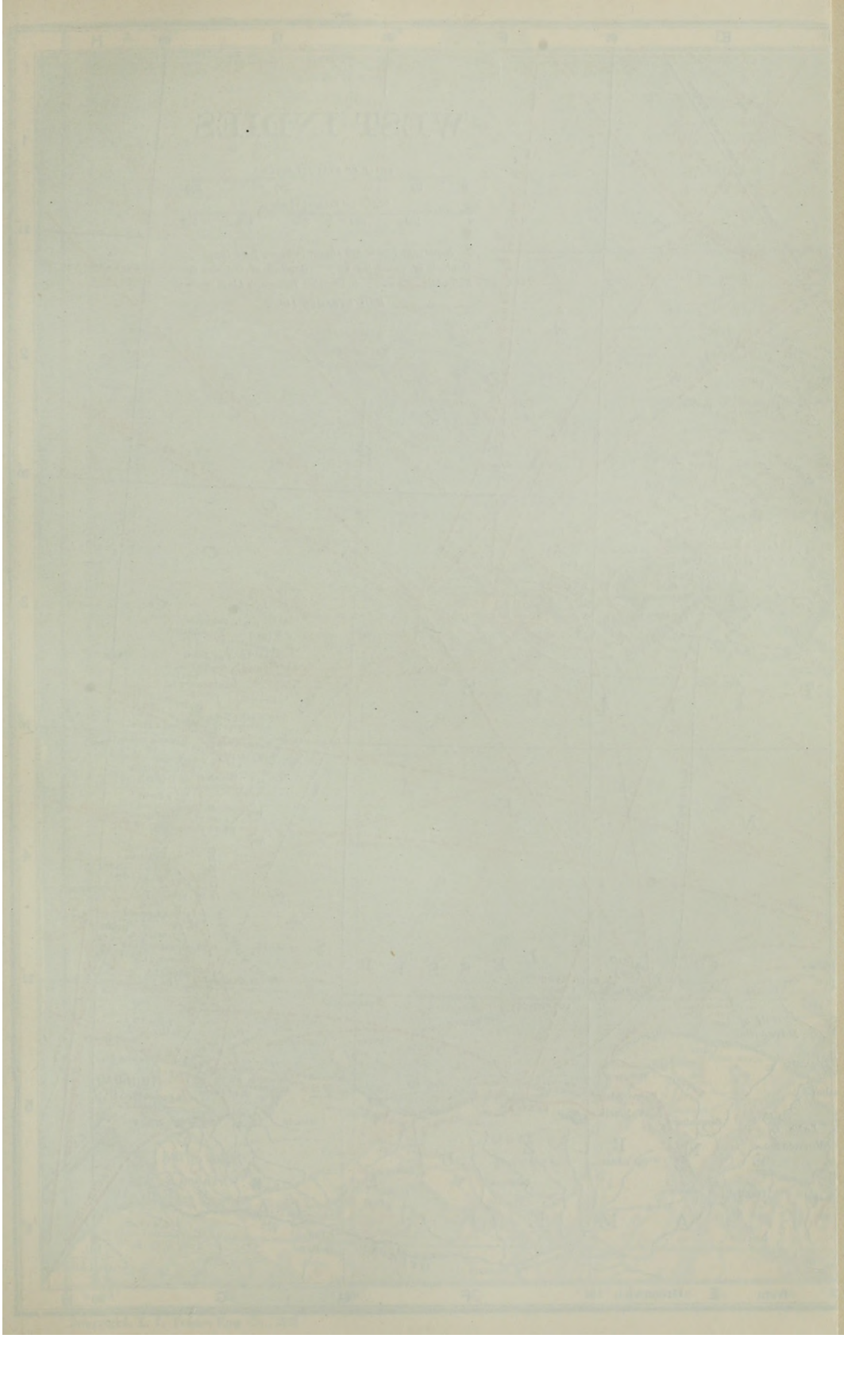
WESTERLY, a city in Washington co., R. I.; on the Pawtucket river, and on the New York, New Haven, and Hartford railroad; 6 miles N. E. of Stonington. It contains numerous churches, hotels, a high school, public library, Soldiers' Memorial Building, street railroads, electric lights, National and savings banks, and daily and weekly newspapers. Westerly is widely known on account of its extensive and excellent granite quarries. It has manufactories of flannel, cotton and woolen goods, and printing presses. Pop. (1910) 8,696; (1920) 9,952.

WESTERN AUSTRALIA, one of the states of the Commonwealth of Australia; includes all that portion of the continent situated W. of lon. 129° E. The territory measures 1,480 miles from Cape Londonderry in the N. to Peak Head in the S., and about 1,000 miles from E. to W. The total estimated area is 975,920 square miles, thus making it the largest of the former Australian colonies. The really occupied portion is confined mainly to the coast region and to gold-mining settlements in the interior. Capital, Perth, on Swan river; pop. about 100,000.

Topography.—The rivers in the S. W. are the Blackwood, Murray, Swan, Murchison, etc.; farther N., the Gascoyne, Ashburton, Fortescue, De Grey, Fitzroy, etc., none of them navigable at all seasons. The interior of Western Australia is in great part sterile, with extensive tracts of scrub and salt marsh; but the colony is as yet imperfectly known. The S. W. has vast forests, which supply valuable timber for exportation, especially that known as jarrah. The Kimberley and N. districts contain boundless pastures, and there are lands suitable for the growth of sugar, tobacco, wheat, etc. In other parts are soils and climates admirably adapted for the cultivation of silk, olives, the vine, etc.

Minerals.—Gold is found at Kimberley and Yilgarn, and at several places between these districts, the chief fields being the Murchison, the Ashburton, and the Rilbarra. The Coolgardie field became prominent in 1895. The total value of the gold export of 1918 was about $20,000,000. Copper and lead are found in abundance. The other chief minerals are coal, tin, and iron. The pearl fisheries are rising in value.

Government.—In 1890 responsible government was conferred on the colony by the British Parliament in a new constitution (amended in 1893, 1899, and 1911), vesting the administration in a governor and Parliament. The latter





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consisted of a legislative Council or Upper House and a Legislative Assembly or Lower House. Education is compulsory, but not free. In 1900 female suffrage was carried by the amendment to the constitution. The estimated revenue for 1920 was over $25,000,000; expenditure, over $30,000,000; debt, about $185,000,000.

History.—Western Australia was first settled in 1829 as the Swan River Settlement, and for many years the population was very small; but in the year 1891 it had risen to 49,782. In 1850 it was made a convict station, and remained such till the abolition of transportation in 1868. Since that time it has been making gradual progress. Pop. about 300,000. See AUSTRALIAN COMMONWEALTH.

WESTERN EMPIRE, THE, a portion of the Roman empire, consisting of Italy, Illyricum, Spain, Gaul, Britain, and Africa, which Valentinian I. reserved for himself when in 364 he shared the imperial authority with his brother Valens, who reigned in Constantipople as Emperor of the East, and whose territories comprised the E. half of the Balkan Peninsula, Greece, Egypt, Syria, and Asia Minor, as far as Persia. This partition of the Roman empire became final in 395, when Theodosius the Great divided the Roman world between his two sons, Honorius, who became Emperor of Rome and the West, and Arcadius, who became Emperor of Constantinople and the East. The Western Empire terminated in 476. See BYZANTINE EMPIRE: ROME.

WESTERN MARYLAND COLLEGE, a coeducational institution in Westminster, Md.; founded in 1867 under the auspices of the Methodist Protestant Church; reported at the close of 1919: Professors and instructors, 23; students, 275; president, Rev. T. H. Lewis, D. D., LL. D.

WESTERN RESERVE, THE, a tract of land in the N. E. of what is now the State of Ohio, once forming part of the claims of Connecticut in the Northwest Territory. When, by the treaty of 1783, Great Britain relinquished the territory S. of the Great Lakes and E. of the Mississippi, disputes arose among the States of Virginia, New York, Massachusetts, and Connecticut as to the right of occupancy in that locality. The difficulty was finally settled by the cession of the whole to the Federal Government, but Connecticut reserved a tract of nearly 4,000,000 acres on Lake Erie. The State finally disposed of this in small lots to colonists, and so accumulated a very large school fund.

WESTERN RESERVE UNIVERSITY, a coeducational non-sectarian institution in Cleveland, O.; founded in 1826; reported at the close of 1919: Professors and instructors, 369; students, 2,787; volumes in the library, 134,000; productive funds, $4,074,039; president, Charles F. Thwing, D. D.

WESTERN SARATOGA, a name given to Waukesha, Wis., which has numerous mineral springs.

WESTFIELD, a town in Hampden co., Mass.; on the Westfield river, and on the New York, New Haven and Hartford and the Boston and Albany railroads; 9 miles west of Springfield. It comprises the villages of West Farms, Little River, Middle Farms, Mundale, East Farms, and Westfield Center. Here are the Western State Normal School, public library, high school, churches, electric lights, waterworks, National and savings banks, and weekly and monthly periodicals. It has manufactories of organs, piano legs, paper, coffin trimmings, bicycles, steam heaters, cigars, whips, etc. Pop. (1910) 16,044; (1920) 18,604.

WESTFIELD, a town of New Jersey, in Union co. It is on the Central Railroad of New Jersey. It is chiefly a residential suburb of New York, and contains many fine residences. Pop. (1910) 6,420; (1920) 9,063.

WEST HOBOKEN, a town in Hudson co., N. J.; opposite New York City and 2 miles W. of Hoboken. It adjoins the N. W. part of Hoboken and is built on elevated ground. Here are St. Michael's Monastery, a Dominican Convent, public and parochial schools, a public park, street railroads, electric lights, trust and savings banks, and weekly newspapers. It has manufactures of penholders, brushes, silk goods, etc. Pop. (1910) 35,403; (1920) 40,074.

WEST INDIES, or the **ANTILLES**, an extensive archipelago lying between North and South America, stretching from Florida to the shores of Venezuela. It is divided into the Bahamas, the group stretching from near the coast of Florida in a S. E. direction; the Greater Antilles, comprising the four largest islands of the group, Cuba, Haiti, Porto Rico, and Jamaica; and the Lesser Antilles, stretching like a great bow, with its convexity toward the E., from Porto Rico to Trinidad, near the coast of Venezuela. Almost the whole archipelago lies within the torrid zone. The total area does not exceed 95,000 square miles, of which the Greater Antilles occupy nearly 83,000 square miles. The climate is extreme-

ly hot, and the islands abound in tropical productions, as sugar, cotton, coffee, cacao, tobacco, maize, etc.; oranges, lemons, limes, pomegranates, citrous pineapples, manioc, yams, potatoes, etc. Except Cuba, Haiti (in which there are two republics); Porto Rico and other islands acquired by the United States from Spain, Virgin Islands acquired by the United States from Denmark, and a few islands off the coast of South America, the West Indian Islands are in the possession of European powers. The chief British possessions are: Jamaica, Barbadoes, St. Lucia, St. Vincent, Trinidad, Tobago, Antigua, St. Kitt's, Dominica, Virgin Islands, and the Bahamas; Dutch St. Eustatius, Saba, St. Martin (partly French), Bonaire or Buen Ayre, Curaçao, and Oruba or Aruba; and French, Martinique, Deseada, Guadeloupe, Marie Galante, St. Martin (partly Dutch), St. Bartholomew, and Les Saintes. Two-thirds of the inhabitants are negroes. Total pop. about 6,000,000.

WEST INDIES, DANISH. See VIRGIN ISLAND.

WESTINGHOUSE, GEORGE, an American inventor; born in Central Bridge, N. Y., Oct. 6, 1846; removed to Schenectady, where he received a public school education; entered the machine shop of his father; and at the age of 15 designed a rotary engine. He served in the Union army in 1863-1864. His inventions include the Westinghouse air brake, electrical machinery, railroad signals, etc. In 1884 he was decorated with the Order of Leopold by the King of Belgium, and in 1889 with the Order of the Crown of Italy by the King of Italy. He died in 1914.

WESTMINSTER ABBEY, the coronation church of the sovereigns of England, and one of the chief ornaments of London. It is a magnificent Gothic pile, situated near the Thames, and adjoining the Houses of Parliament. In 1065 a church was built here in the Norman style by Edward the Confessor. Part of this structure still remains in the pyx house and the S. side of the cloisters; but the main building, as it now stands, was begun in 1220 by Henry III. (who built the choir and transepts), and was practically completed by Edward I. Various additions, however, were made (including the nave and aisles, the W. front, and the Jerusalem Chamber) down to the time of Henry VII., who built the chapel which bears his name, while the upper parts of the two W. towers were designed by Sir Christopher Wren.

The extreme length of the church, including Henry VII.'s chapel, is 531 feet; breadth of transepts, 203 feet; height of roof, 1024 feet; height of towers, 225 feet. The coronation ceremony takes place in the choir, where the coronation stone brought by Edward I. from Scotland is situated beside the coronation chairs of the English sovereigns. Westminster Abbey is distinguished as the burial place of a large number of English kings from Edward the Confessor to George II.; the N. transept is occupied chiefly by monuments to warriors and statesmen; while in the S. transept is situated the "Poets' Corner," the burial and memorial place of most of England's great writers since Chaucer's time. See LONDON.

WESTMINSTER COLLEGE, a coeducational institution in New Wilmington, Pa.; founded in 1852, under the auspices of the United Presbyterian Church; reported at the close of 1919: Professors and instructors, 15; students, 200; president, W. C. Wallace, D. D.

WESTMINSTER HALL, the hall of the old palace of Westminster, in London; erected by Richard II. (1397-1399) on the foundations of a structure built by William Rufus. It has a fine porch, and its hammer-beam roof of carved timber is considered the most notable of its kind; length of the building 290 feet, breadth 68 feet, and height 110 feet. The building is closely associated with many stirring events in English history; but it is chiefly remarkable as the place where were held such great state trials as those of the Chancellor More, Lady Jane Grey, the Earl of Strafford, King Charles I., and Warren Hastings, and as the center of the highest English courts of law till these were removed to the new buildings erected for their accommodation. The hall now serves as a vestibule to the Houses of Parliament.

WEST NEW YORK, a town of New Jersey, in Hudson co. It is on the Hudson river, and is connected with New York City by ferry at 42d st. Its industries include the manufacture of silk, rubber goods, cottonseed oil, textiles, sugar, and powder. Pop. (1910) 13,560; (1920) 29,926.

WEST ORANGE, a town of New Jersey, in Essex co., on the Erie railroad. It is beautifully situated at the base of Orange Mountains, is an important manufacturing center, and contains the laboratories of the Edison Company. There are two public parks and many handsome residences. Pop. (1910) 10,980; (1920) 15,573.

WEST PALM BEACH, a part of the city of Palm Beach, Fla. Pop. (1910) 1,743; (1920) 8,659.

WEST PARK, a city of Ohio, in Cuyahoga co., on the Lake Shore and Michigan Southern, and the Cleveland, Cincinnati, Chicago, and St. Louis railroads. It is a residential suburb of Cleveland. Pop. (1910) 3,179; (1920) 8,581.

WESTPHALIA, the name given at different periods to (1) one of the circles of the old German empire, (2) one of Napoleon's kingdoms (1807-1813), conferred on his brother Jerome; and (3) now to a province of Prussia. The latter is bounded by Rhenish Prussia, Holland, Hanover, Brunswick, Hesse, and Nassau. Its area is 7,803 square miles. The surface in the S. and N. E. is generally mountainous; the northwest spreads out into extensive and often marshy plains, and belongs to the basin of the Ems; the northeast and a small part of the east to the basin of the Weser; the remainder, constituting the far larger portion of the whole, belongs to the basin of the Rhine, whose chief tributaries are the Ruhr and Lippe. Besides iron and coal in abundance the minerals include copper, lead, zinc, marble, slate, sulphur, antimony, and salt; and the manufactures are varied and important. The province is divided into the three circuits of Münster, Minden, and Arnsberg. Münster is the capital. Pop. about 4,500,000.

WESTPHALIA, PEACE OF, the name given to the peace concluded in 1648 at Münster and Osnabrück, by which an end was put to the Thirty Years' War. By this peace the sovereignty of the members of the empire was acknowledged. The concessions that had been made to the Protestants since the religious peace in 1555 were confirmed. The elector-palatine had the palatinate of the Rhine and the electorate restored to him; Alsace was ceded to France; Sweden received western Pomerania, Bremen, Verden, Wismar, and a sum equal to $3,750,000; Brandenburg, Mecklenburg, Hanover, and Brunswick were compensated by the secularization of numerous ecclesiastical foundations. The independence of the United Provinces was recognized by Spain, and that of Switzerland by the empire. See THIRTY YEARS' WAR.

WEST POINT, a United States military post in Orange co., N. Y.; on the Hudson river, and on the West Shore and the New York, Ontario and Western railroads; 52 miles N. of New York City. It is widely known as the seat of the United States Military Academy. Here are a cemetery where the remains of many distinguished army officers are interred, and the ruins of Fort Putnam. During the Revolutionary War, West Point was fortified to control the river, and a heavy chain was stretched across the river to Constitution Island to prevent British warships from ascending the river. In 1777 the place was captured and destroyed by the British, but new fortifications were built at a cost of $3,000,000. Benedict Arnold was given command of the place Aug. 5, 1780, but escaped on the 25th, after the apprehension of Maj. John André, and the discovery of their plot. There are several important monuments in West Point, including the statue of General Sedgwick, the monument of Kosciusko, that of Major Dade, etc. See UNITED STATES MILITARY ACADEMY.

WEST SPRINGFIELD, a town which includes several villages, in Massachusetts, in Hampden co., on the Connecticut river and on the Boston and Albany railroad. It is the center of an important farming and market gardening region, and has manufactures of paper and cigars. There are many interesting old houses, a high school building, and a public library. Pop. (1910) 9,225; (1920) 13,443.

WEST TAMPA, a city of Florida, in Hillsboro co., adjoining Tampa. It is one of the most important cigar manufacturing centers of the United States. Pop. (1910) 8,258; (1920) 8,463.

WEST VIRGINIA, a State in the South Atlantic Division of the North American Union; bounded by Pennsylvania, Maryland, Virginia, Kentucky, and Ohio; admitted to the Union, June 19, 1863; capital, Charleston; number of counties, 55; area, 24,170 square miles. Pop. (1890) 762,794; (1900) 958,800; (1910) 1,221,119; (1920) 1,463,701.

Topography.—The State is hilly and mountainous. The Allegheny Mountains form the Virginia boundary line. A continuation of the Cumberland Mountains of Tennessee crosses the State about 20 miles W. of the Alleghenies. This range embraces the Flat Top, Cotton Hill, Greenbrier, Gauley, and Rich mountains. The surface W. of these mountains gradually descends to the Ohio river, this river forming the principal water system of West Virginia. The chief rivers are the Big Sandy, Kanawha, Guyandotte, and Monongahela, all of which are navigable and enter the Ohio. The Kanawha is fed by the Greenbrier, Gauley, Elk, and Coal rivers. The Potomac river forms part of the N. boundary line. There are numerous waterfalls in these streams all of which afford excellent water power, the falls at Harper's Ferry being especially noted.

Geology and Mineralogy.—The E. por-

tion of the State is of Eozoic formation. This is bordered by Lower Silurian shales, limestone and medina sandstone, and by coal measures covering over 16,000 square miles.

Agriculture.—The soil consists of disintegrated limestones, sand, clay, and loam, giving it exceeding fertility. Nearly all garden vegetables and cereals grow abundantly.

The acreage, production and value of the principal crops in 1919, was as follows: corn, 735,000 acres, production 24,990,000 bushels, value $40,984,000; oats, 190,000 acres, production 4,750,000 bushels, value $4,320,000; wheat, 400,000 acres, production 5,400,000 bushels, value $11,880,000; tobacco, 15,000 acres, production 10,500,000 pounds, value $5,250,000; hay, 810,100 acres, production 1,215,000 tons, value $31,104,000; potatoes, 57,000 acres, production 5,130,000 bushels, value $8,978,000.

Mineral Production. — The State is among the most important in the production of minerals. In the order of their importance, they are coal, natural gas, petroleum, and clay products. The coal production in 1919 was 75,500,000 short tons, a decrease of 14,436,000 short tons over that of 1918. The State ranks second in the quantity of coal produced, and is surpassed only by Pennsylvania. The production of natural gas in 1918 was 265,160,917 thousand cubic feet. West Virginia ranks first in the production of natural gas. The production of petroleum in 1918 was 7,886,628 barrels, valued at $31,652,108. There are important quarries of sandstone and limestone, and the mining of salt is also an important industry.

Manufactures.—There were in the State, in 1914, 2,749 manufacturing establishments, employing 71,078 wage earners. The capital invested was $175,995,000; wages paid $43,784,000; value of materials used $110,033,000; and the value of the products $193,512,000.

The principal articles of manufacture were iron and steel, lumber, and timber products, flour and grist, coke, railroad cars, packed meat, tobacco, cigars, and cigarettes, pottery, glass, foundry and machine shop products, and clothing.

Banking.—On Oct. 31, 1919, there were reported 119 National banks in operation, having $11,244,000 in capital; $9,313,000 in outstanding circulation; and $25,371,000 in United States bonds. There were also 214 State banks, with $14,741,000 capital, and $8,962,000 surplus. The exchanges at the United States clearing house at Wheeling, during the year ending Sept. 30, 1919, aggregated $226,320,000.

Education.—Elementary education is free from the ages of 6 to 21 years, and school attendance is compulsory for children between the ages of 8 and 14. There are about 7,000 public elementary schools, with about 315,000 pupils, and about 11,000 teachers. There are 164 public high schools and 6 public normal schools. The annual expenditure for education is about $8,000,000. The institutions for higher education include the West Virginia University at Morgantown, Bethany College, and West Virginia Wesleyan College.

Charities and Corrections.—The institutions under the control of the State Board of Control are as follows: Hospitals at Weston, Spencer, Huntington, Welch, McKendree and Fairmont; penitentiary at Moundsville; industrial home for girls at Industrial; school for the deaf and blind at Romney; tuberculosis sanatorium at Terra Alta; colored tuberculosis sanatorium at Denmar; children's home at Elkins; and colored orphans' home at Huntington.

Churches.—The strongest denominations in the State are the Methodist Episcopal, North; Regular Baptist; Methodist Episcopal, South; Roman Catholic; United Brethren; Methodist Protestant; Presbyterian, South; Disciples of Christ; Presbyterian, North; Colored; and Dunkards.

Railways.—The railway mileage in 1919 was 4,007.7. The roads having the longest mileage are the Baltimore and Ohio and the Norfolk and Western.

Finances.—The receipts for the fiscal year 1918-1919 were $5,010,573, and the disbursements $6,693,653. There was a balance at the end of the year of $2,218,091. The assessed value of real estate in 1919 was $767,653,310, and of personal property $372,631,062. The total bonded indebtedness of the State on Jan. 1, 1920, was $13,500,000.

State Government.—The governor is elected for a term of four years. Legislative sessions are held biennially in odd years beginning on the second Wednesday in January, and are limited in length to 45 days each. The Legislature has 30 members in the Senate, and 94 in the House. There are 6 Representatives in Congress under the new appointment.

History.—The history of the State prior to 1861 is identified with that of Virginia proper, of which State it formed part till after the outbreak of the Civil War. The Allegheny Mountains, however, formed a natural line of demarkation between the two sections of the original State, and conditions favoring separation had long existed. These reached a climax on the passage by

Virginia of an ordinance of secession, the popular vote in the section W. of the mountains being strongly opposed to it. A convention of loyalists met at Wheeling in June, 1861, and in August adopted an ordinance providing for the formation of a new State to be called Kanawha. In November a constitution was adopted and the name West Virginia chosen. This constitution was adopted by the people by a very large majority in April, 1862, and the State was formally admitted to the Union by Act of Congress and the approval of President Lincoln, June 19, 1863.

WEST VIRGINIA UNIVERSITY, a coeducational non-sectarian institution in Morgantown, W. Va.; founded in 1867; reported at the close of 1919: Professors and instructors, 123; students, 1,609. President F. B. Trotter, LL. D.

WESTWARD HO, a seaside resort on the coast of North Devon, England, 2½ miles W. of Bideford. It owes its existence to Charles Kingsley's Elizabethan romance (1855), of the same name, which attracted swarms of visitors to North Devon. For their accommodation this pretty cluster of villas and lodging houses, with its church, hotel, club house, and college, has sprung up since 1867. The bathing facilities are excellent, and it is a great resort of golfers. The village is in the parish of Northam.

WETMORE, GEORGE PEABODY, a United States Senator from Rhode Island, born at London, England, in 1846. He graduated from Yale in 1867, and from the Columbia Law School in 1869. In the same year he was admitted to the bar. He was trustee of the Peabody Museum of Natural History of Yale, and of the Peabody Educational Fund. In 1885-1886, and again in 1886-1887, he was governor of Rhode Island. He was defeated for a third term in the latter year, and was defeated for the United States Senate in 1889. He was, however, elected to that office in 1895, and was re-elected in 1900 and 1906.

WETTER, a lake in Sweden; about 24 miles S. E. of Lake Wener; greatest length, 80 miles; medium breadth, about 15 miles. Its height above the level of the Baltic is nearly 300 feet, but its depth is in some parts above 400 feet. The Wetter forms parts of the canal connections betwen the Cattegat and the Baltic. The chief town on its shores is Jönköping.

WETTERHORN ("peak of tempests"), one of the most striking peaks of the Bernese Oberland; has three summits—the W., called by the natives Hasli-Jungfrau, 12,147 feet high; the middle, known as the Mittelhorn, 12,165 feet; and the E., the Rosenhorn, 12,110 feet. These were ascended first in 1844 and frequently since, the ascent being made from Grindelwald, and the previous night spent at a club hut built among the rocks, at the foot of the main peak. The contrast between the bright fresh pastures and the black precipices and dazzling snow ridges of the Wetterhorn is particularly striking, making the valley of the Reichenbach a favorite resort of artists.

WETZLAR, a town of Rhenish Prussia; on the Lahn; 95 miles S. E. of Köln. It has a cathedral, built at intervals during the 13th, 14th, and 15th centuries, and still unfinished. Protestants worship in the choir, Catholics in the nave. There are also a gymnasium and a synagogue, and glove factories, spinning, iron works, phosphorus works, etc. Wetzlar is a scene in Goethe's "Werther." It first appears in history during the 12th century. The Diet of Spires met here from 1689 to 1808. Pop. about 15,000.

WEXFORD, the capital of the county of the same name, in Ireland, 93 miles S. of Dublin; at the mouth of the Slaney river, which here expands to form a harbor 6 miles long. It contains three Roman Catholic churches, two Episcopal, one of which, St. Selsker, dates from about 1,200, and meeting houses belonging to minor sects, St. Peter's College, a preparatory school for Maynooth, a diocesan Protestant school, and various others. The trade is chiefly retail, but corn, poultry, and oysters are shipped to Liverpool, with which there is regular steamboat communication. The harbor is finely situated, but a bar at its mouth prevents the entrance of any but small vessels. Parts of the old fortifications and of St. Selsker's priory remain. The town is extremely ancient, and was occupied by the Danes as one of their strongest settlements; and from the time of the invasion it became an English stronghold against the native population. During the civil wars of 1641 it was occupied by the confederate Catholics, but was taken by Cromwell in 1644. The insurgents of 1798 also had possession of it for a short time. Pop. about 15,000.

WEYLER, VALERIANO, MARQUIS OF TENERIFFE, a Spanish military officer; born in 1839 of a Prussian father and Spanish mother. He early obtained a record for excessive barbarity. He arrived at Havana, Cuba, as Captain-General of the island on Feb. 10, 1896.

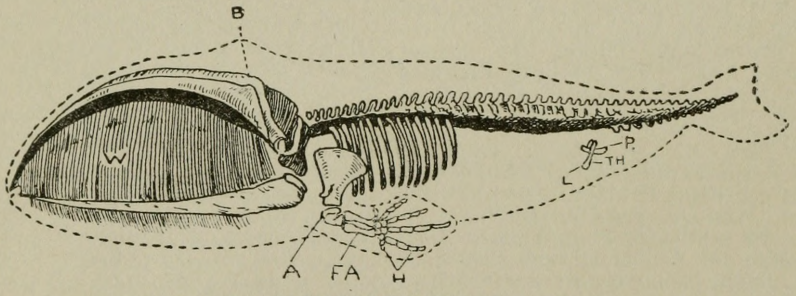
Here he further established his infamy by his cruel and inhuman treatment to the Cubans, and earned for himself the name of "Butcher Weyler." In his management of Cuban affairs Weyler had the support of the home government, under the control of the Conservative party. As a result of the resignation of the Conservative premier and cabinet Weyler was succeeded by General Blanco in the latter part of 1897. In 1902 he was Spanish minister of war. He was appointed Captain-General of Catalonia in 1909.

WEYMAN, STANLEY JOHN (wī′man), an English novelist; born in Ludlow, Shropshire, England, Aug. 7, 1855; was educated at Christ Church, Oxford; became classical instructor in the King's School, Chester, in 1878; called to the bar in 1881, and practiced till 1890. He contributed to periodicals in 1883, and published in book form the historical romances: "The House of the Wolf" (1890); "Francis Cludde" (1891); "The New Rector" (1891); "A Gentleman of France" (1893); "Under the Red Robe" (1894); and "My Lady Rotha" (1894); "Memoirs of a Minister of France"; "The Red Blockade" (1895); "The Man in Black" (1896); "Shrewsbury" (1897); "The Castle Inn" (1898); "Abbess of Vlaye" (1904); "Wild Geese" (1908), etc. Several of his stories have been dramatized.

WEYMOUTH, a seaport and market-town of England, in Dorsetshire, comprising the town and chapelry of Weymouth and the town and parish of Melcombe, the former on the S. and the latter on the N. side of the Wey, 8 miles from Dorchester. Weymouth is old and pooly built. It communicates with Melcombe, to which it is united by a handsome bridge. It became a place of fashionable resort, in consequence of its being frequented by George III., and is now greatly enlarged by the addition of many new and elegant buildings. Pop. about 20,000.

WEYMOUTH, a town in Norfolk co., Mass., on the South Shore line of the New York, New Haven and Hartford railroad; 12 miles S. E. of Boston. The town contains the villages of North Weymouth, East Weymouth, Weymouth Center, South Weymouth, Weymouth Heights, Nash, Lovells Corner, Old Spain, and Weymouth Landing. It is a seashore summer resort, but has extensive manufacturing and shipbuilding interests. The principal manufactures include boots, shoes, fertilizers, fireworks, hammocks, boxes, and clothing. There are daily and weekly newspapers, a National bank, electric lights, and street railways, public schools, public library. It is the second oldest town in the State, having been incorporated Sept. 2, 1635. Pop. (1910) 12,895; (1920) 15,057.

WHALE, a name that may be taken as equivalent to Cetacean, and applied to any member of that order of mammals, which includes two great sets:



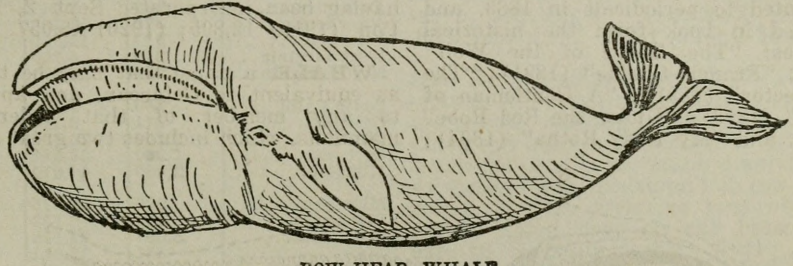
SKELETON OF WHALE

B Blow-hole
A Upper arm
FA Fore arm
H Hand
P. TH. L. Remains of hip bone
W Whale bone

the toothed whales, such as sperm whale and dolphin, and the whalebone whales, such as right whale and rorqual, in which the teeth are only embryonic. The order *Cetacea* is usually divided into three sub-orders: (1) the *Mystacoceti* or *Balænoidea*, baleen or whalebone whales; (2) the *Odontoceti* or *Delphinoidea*, toothed whales; and (3) the *Archæoceti* or extinct Zeuglodonts. The differences between the extant sub-orders are so great that any idea of the close relationship must be abondoned; their common ancestry must be far back, and indeed it is doubtful whether our classification might not be brought nearer the truth by recognizing two distinct orders. Less specialized than the modern types are the extinct Zeuglodonts of the Eocene

period, but it is by no means certain that they should be included within the order *Cetacea*.

WHALEBONE, a horny substance, occurring in long, thin plates, fringed at the edges, and acting as a strainer to detain the whale's food when the animal ejects the water which it has swallowed with the medusæ and small fry which constitute its food. The principal source of whalebone is the "right whale," so called, the *Balæna mysticetus* or *australis*. Some 300 of the plates are found in the mouth of an adult whale, and vary from 10 to 15 feet in length. Being very flexible, strong, elastic, and light, whalebone is employed for many purposes, as for ribs to umbrellas and parasols, for stiffening ladies' corsets, etc. Also, and more properly, called baleen.



BOW-HEAD WHALE

WHALLEY, EDWARD, an English regicide; born in England presumably about 1620. During the Revolution of 1642 he was a member of the Parliamentarian party, and commanded the force that defeated the cavalry of Sir Marmaduke Langdale at Naseby in 1645. Subsequently he was made custodian of King Charles at Hampton Court. He was a member of the court which condemned that monarch to death, and he also signed his death warrant. After the restoration of the Stuarts Whalley fled to America with his son-in-law, William Goffe. He died in Hadley, Mass., about 1678.

WHARTON, EDITH (NEWBOLD JONES), an American novelist, born in New York City in 1862. In 1885 she married Edward Wharton of Boston. She achieved great success by her first novel "The Greater Inclination" (1899). This was followed by "Crucial Instances" (1901); "The Valley of Decision" (1902); "The House of Mirth" (1906); "The Fruit of the Tree" (1907); "The Custom of the Country" (1913); "Xingu" (1916); "The Age of Innocence". She took an active part in relief work in France during the World War and wrote "Fighting France" (1915); and "Summer" (1917). Mrs. Wharton was recognized as one of the most talented American writers of modern fiction. She was made a Chevalier of the Legion of Honor of France for her services during the war.

WHARTON, FRANCIS, an American jurist; born in Philadelphia, Pa., March 7, 1820; was graduated at Yale College in 1839, and admitted to the bar in 1843. From 1856 to 1863 he was Professor of Logic and Rhetoric in Kenyon College, O.; in 1863 was ordained in the Protestant Episcopal Church and became rector of St. Paul's in Brookline, Mass., and in 1866 became a professor in the Episcopal Divinity School at Cambridge, Mass. He also held the chair of international law in the Boston Law School. In 1885 he was appointed solicitor for the State Department. Under a resolution of Congress (1888) he was made editor of the Revolutionary diplomatic correspondence of the United States. He wrote extensively on legal and theological subjects. His best known work is a "Treatise on the Criminal Law of the United States" (1846), which is accepted as a standard. He wrote also: "Precedents of Indictments and Pleas"; a "Treatise on Medical Jurisprudence," "The Conflict of Laws" (1872); "The Law of Agency and Agents" (1876); "Commentary on the Law of Contracts" (1882); "Treatise on the Law of Evidence and Criminal Issues." He died in Washington, D. C., Feb. 21, 1889.

WHATELY, RICHARD, an English clergyman; born in London, England, Feb. 1, 1787, son of the Rev. Joseph Whately. He received his education at a private school at Bristol, and at Oriel College, Oxford. He graduated B. A. in 1808, and in 1810 won the English essay prize. In 1819 he made his first appearance as an author by publishing his famous "Historic Doubts relative to Napoleon Bonaparte." In 1822 Whately was appointed Bampton lecturer at Ox-

ford, and delivered eight lectures "On the Use and Abuse of Party Feeling in Matters of Religion." He held the living of Halesworth in Suffolk in 1822-1825, and was then appointed principal of St. Alban's Hall, Oxford. In the latter year he published "Essays on Some of the Peculiarities of the Christian Religion." A second series of essays "On Some Difficulties in the Writings of St. Paul and Other Parts of the New Testament," came out in 1828; and a third series, "The Errors of Romanism traced to their Origin in Human Nature," in 1830. In 1827 was published "The Elements of Logic," and the scarcely less popular "Elements of Rhetoric" in 1828. Both of these works were written originally for the "Encyclopædia Metropolitana." He occupied the chair of political economy at Oxford in 1830-1831, and afterward published "Introductory Lectures on Political Economy." Appointed Archbishop of Dublin, 1831. Died Oct., 1863.

WHEAT, the most valuable and, next to maize or Indian corn, the most productive of all the cereal grasses. The genus *Triticum* of which the species are popularly known either as wheat or wheat grass, are distinguished by a spike with many-flowered spikelets without stalks, and seated one on each notch of the rachis, their sides directed to the rachis, which is zigzag, and two glumes, of which the lower is either awned or awnless; the outer palea of each floret having at the top a notch, in the center of which is the terminal point, sometimes prolonged into an awn, or in some species with many florets tapering into an awn without a notch. The native country of the cultivated wheat has generally been supposed to be the central part of Asia; but the *Ægilops ovata*, a grass of the regions near the Mediterranean, and of western Asia, becomes transformed by cultivation into wheat and may be regarded as the original form. Common wheat (*T. vulgare*, *æstivum*, or *sativum*) grows to a height generally of three or four feet, and has ears or spikes generally three or four inches in length; the spike four-cornered, the spikelets about four-flowered. Besides being classified as bearded and beardless the varieties in cultivation are distinguished according to the color of the grain, as white and red wheats. Some having the ears covered with a short soft down are known as woolly wheats. Innumerable varieties exist. Many parts of the United States and British provinces and wide regions of South America are admirably adapted to its cultivation. The value of wheat depends mainly on the quantity of fine flour which it yields; the best wheat yielding 76 to 80 per cent., sometimes even 86 per cent., of fine flour. The greater part of the husk of wheat is separated from the flour by the miller, and is known as bran. That portion of the bran which is more finely divided than the rest receives the name of sharps or pollards.

The following table shows the acreage, production, and value of the wheat crop in the United States in the calendar year 1920:

State.	Acreage*	Production Bushels*	Total Farm Value*
Maine	7	159	$366
Vermont	11	209	418
New York	500	10,998	19,247
New Jersey	95	1,520	3,116
Pennsylvania	1,524	25,284	42,983
Delaware	120	2,040	3,488
Maryland	670	11,390	18,794
Virginia	914	11,425	20,565
West Virginia	340	4,250	8,075
North Carolina	724	8,471	17,789
South Carolina	160	1,760	4,488
Georgia	211	2,110	5,064
Ohio	2,259	28,698	47,352
Indiana	1,960	23,540	39,312
Illinois	2,650	40,670	65,479
Michigan	938	14,275	23,982
Wisconsin	341	5,152	7,934
Minnesota	3,001	29,116	37,851
Iowa	831	13,011	18,074
Missouri	2,617	32,721	52,354
North Dakota	7,600	68,400	88,920
South Dakota	2,886	26,282	30,224
Nebraska	3,593	60,480	79,229
Kansas	8,903	137,056	178,173
Kentucky	550	5,610	10,715
Tennessee	424	4,028	7,855
Alabama	68	653	1,502
Mississippi	10	100	213
Texas	1,225	15,925	27,391
Oklahoma	2,890	46,240	62,424
Arkansas	126	1,197	2,274
Montana	1,750	19,850	25,408
Wyoming	254	5,080	6,858
Colorado	1,240	22,821	30,808
New Mexico	330	6,375	8,925
Arizona	36	864	2,264
Utah	280	5,366	8,210
Nevada	18	420	756
Idaho	1,050	23,600	29,500
Washington	2,329	37,982	51,276
Oregon	1,107	22,900	29,770
California	650	9,100	16,380
United States.	57,192	787,128	1,135,806

* 000 omitted.

WHEATLEY, HENRY BENJAMIN, an English philologist; born in Chelsea, London, England, May 2, 1838. He was an official of various London literary and other societies. Besides editing a number of works, he wrote: "Anagrams" (1862); "Round About Piccadilly and Pall Mall" (1870); "Samuel Pepys and

the World He Lived In" (1880); "Decorative Art" (1884); "How to Form a Library" (1886); "How to Catalogue a Library" (1887); "Literary Blunders" (1893); "Hogarth's London" (1909), etc.

WHEATON, FRANK, an American military officer; born in Providence, R. I., May 8, 1833; was graduated at Brown University; entered the army as lieutenant in the 1st United States Cavalry in 1855, and until the outbreak of the Civil War was chiefly engaged in campaigns against the Indians in Nebraska, Missouri, and Kansas; was promoted captain in March, 1861, and colonel, July 21, 1861; and was appointed a Brigadier-General of volunteers in November, 1862. He served with the Army of the Potomac throughout the Civil War, taking part in the battle of Gettysburg, the Shenandoah Valley campaign, and in other important movements; was promoted Brigadier-General, in April, 1892, and Major-General in April, 1897; and was retired May 8, following. He died June 18, 1903.

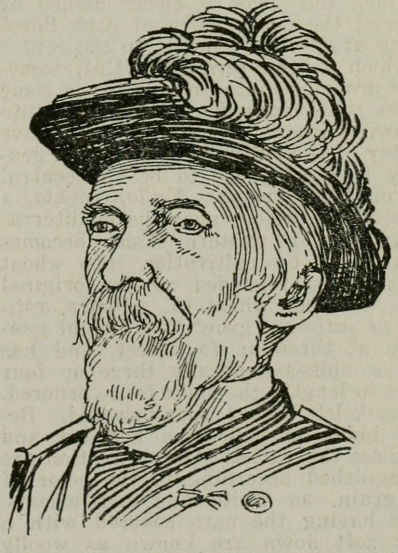
WHEATON, HENRY, an American jurist; born in Providence, R. I., Nov. 27, 1785; was graduated at Brown University, 1802; practiced law in New York, 1812, and edited the "National Advocate." He was a reporter of the United States Supreme Court in 1816-1827, and then became chargé d'affaires to Denmark (1827-1835), and in 1835-1846 minister to Berlin. His chief writings are: "Digest of Maritime Law" (1815); "Life of William Pinkney" (1826); "Reports of Cases in the Supreme Court" (12 vols. 1827); "History of the Northmen" (1831); "Elements of International Law" (1836); "History of the Law of Nations" (1841). He died in Dorchester, Mass., March 11, 1848.

WHEATON, LLOYD, an American military officer; born in Michigan, July 15, 1838; served through the Civil War; won distinction in the battle of Shiloh and in other important actions; and became colonel of the 8th Illinois Volunteers. On July 1, 1866, he was appointed captain in the 34th United States Infantry; Sept. 11, 1895, was commissioned colonel of the 7th Infantry; and in July, 1898, was appointed a Brigadier-General of volunteers. During the Spanish-American War he commanded the 1st Brigade, 1st Division of the 7th Army Corps. In January, 1899, he was assigned to duty with the 20th Infantry in the Philippines, and in 1901 was promoted Brigadier-General, U. S. A. He retired in 1902.

WHEATON COLLEGE, an institution for the higher education of women, established in Norton, Mass., in 1834, as the Newton Female Seminary. In 1912 it assumed the name and rank of a college. The productive funds amount to about $1,000,000. There were in 1919 30 instructors and 200 students. President, Samuel V. Cole, D. D.

WHEELER, BENJAMIN IDE, an American educator; born in Randolph, Mass., July 15, 1854; was graduated at Brown University in 1875; became Professor of Philology at Cornell University in 1886 and of Greek in 1888; accepted the similar chair in the American School of Classical Studies at Athens, Greece, in 1896; and was elected president of the University of California in July, 1899. In 1909-1910 he was Roosevelt professor at the University of Berlin. In 1919 he became president emeritus of the University of California. He was the author of "The Greek Noun-Accent" (1883); "Analogy in Language" (1887); "Introduction to the History of Language" (1890); "Organization of Higher Education in the United States" (1896); "Life of Alexander the Great" (1900); etc., and was the editor of the department of philology in "Johnson's Universal Cyclopædia" and of Macmillan's "Dictionary of Philosophy and Psychology."

WHEELER, JOSEPH, an American military officer; born in Augusta, Ga., Sept. 10, 1836; was graduated at the



BRIGADIER-GENERAL JOSEPH WHEELER

United States Military Academy in 1859; served in the cavalry till the outbreak of the Civil War, when he entered the Confederate army, in which he was commis-

sioned Major-General and senior commander of cavalry. He won great distinction during the Civil War as a raider. On Oct. 2, 1863, he crossed the Tennessee river and led 4,000 mounted men up the Sequatchie valley, where he burned a Union supply train of nearly 1,000 wagons; and was afterward attacked and forced to withdraw by Col. E. M. McCook. He then moved to McMinnville, where he destroyed another supply train and captured about 600 men. Gen. George Crook attacked him at Farmington, capturing 200 of his men, four guns, and 1,000 small arms. Wheeler then crossed the Tennessee, having taken property of an estimated value of $3,000,000, but with a loss of 2,000 men. In July, 1864, he was ordered with 8,000 men to harass General Sherman's rear. In August he moved against Sherman's supply depot at Allatoona, but was repulsed. Later he made a dash into East Tennessee and threatened McMinnville, Murfreesboro, and Lebanon, but was driven into northern Alabama. After the war he entered the law profession; held a seat in Congress in 1881-1899; and was made Major-General of volunteers in May, 1898. During the Santiago campaign in Cuba he commanded the Cavalry Division; participated in the battles of Las Guasimas and San Juan Hill; was appointed senior member of the commission to make arrangements for the surrender of the Spanish army; served in the Philippines as commander of the 1st Brigade, 2d Division, from August, 1899, to January, 1900; was appointed a Brigadier-General, U. S. A., June 16, 1900, and was retired on Sept. 10, following. He died in 1906.

WHEELER, WILLIAM ALMON, an American statesman; born in Malone, N. Y., June 30, 1819. He was admitted to the bar in 1845; in 1857 he became a banker and was also connected with the management of railroads. He was a member and president *pro tem.* of the State Senate, 1858-1859; and was elected to Congress in 1860, serving only one term; was president of the State Constitutional Convention in 1867; served in Congress from 1869-1877; was chairman of the committee on the Pacific railroad company. He was the first member of Congress to return his "back pay." He settled the Louisiana difficulties by the bill called the "Wheeler Compromise." In 1876 he was nominated for Vice-President by the Republican party and was elected. He died in Malone, June 4, 1887.

WHEELING, a city and county-seat of Ohio co., W. Va.; on the Ohio river, and on the Wheeling and Lake Erie, the Pittsburgh, Cincinnati, Chicago and St. Louis, the Ohio River, the Baltimore and Ohio, and the Wheeling and Lake Erie railroads; 65 miles S. W. of Pittsburgh, Pa. Part of the city is on an island in the river, connected with the main part by bridges. Here are a United States Government building, court house, public library, Masonic and Odd Fellows' halls, Wheeling and city hospitals, waterworks, street railroad and electric light plants, National, State, and savings banks, and a number of daily, weekly, and monthly periodicals. Manufacturing is greatly promoted by the natural gas and bituminous coal found abundantly in the vicinity. The principal plants include steel and iron works, blast furnaces, glass factories, tobacco and cigar factories, foundries, boiler works, stove works, canneries, ice factory, machine shops, brass foundry, planing mills, etc. Wheeling was settled in 1769, and was the scene of battles with the British and Indians during the Revolutionary War. In 1863-1870, and in 1875-1885 it was the State capital. Pop. (1910) 41,641; (1920) 56,208.

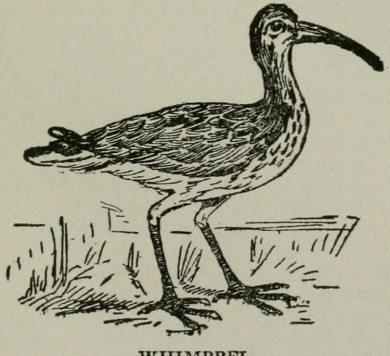
WHEWELL (hū'ĕl), **WILLIAM**, an English philosopher; born in Lancaster, England, May 24, 1794; was graduated at Trinity College, Cambridge, in 1816; became fellow and tutor of his college; in 1828 was elected Professor of Mineralogy. In 1832 he resigned this chair for that of moral philosophy, which he held till 1855, when he became vice-chancellor of the university. In 1841 he was nominated to the mastership of Trinity, and in this position he labored successfully to obtain for the natural and moral sciences a better recognized position among the studies of the university. He became fellow of the Royal Society in 1820, and was one of the first members of the British Association, of which he was president in 1841. Among Whewell's multifarious writings may be mentioned the Bridgewater treatise, "Astronomy and General Physics, considered with reference to Natural Theology" (1833); "History of the Inductive Sciences" (1837); "Philosophy of the Inductive Sciences" (1840); "History of Scientific Ideas; Elements of Morality, including Polity" (1845); "On Liberal Education in General; Lectures on the History of Moral Philosophy in England" (1852); "Platonic Dialogues" (1859-1861); "Lectures on Political Economy" (1863). He died in Cambridge, March 6, 1866.

WHIG, in English history, a term applied to the members of one of the great political parties in Great Britain. Originally it was a Scotch term, and appears to have been first used in Scot-

land in the reign of Charles I., and in England in that of Charles II.

In United States history, the name Whig was first applied to the supporters of the cause of the colonies against the English king in the Revolutionary War. The name was doubtless applied to the opponents of the king, from the fact that in England the same name was applied to the opposers of the royal prerogative in the time of James II., who were ultimately successful in unseating that monarch. After the Revolution the name Whig disappeared from politics, and the people of the country divided into Federalists and Democrats. The party platform of both parties, being gradually altered to meet existing exigencies, the name Federalist was dropped and the term Whig again resuscitated and applied to the opponents of the Democratic party. This name was retained till the agitation of the slavery question induced the formation of a new party, advocating the abolition of slavery and composed of recruits from the ranks of both the Democratic and Whig parties. To this new party the name Republican was applied, and after its formation the name Whig disappeared from American politics.

WHIMBREL, in ornithology, the *Numenius phæopus*, widely distributed from the N. of Europe and Asia to the N. of Africa and India, visiting England in its spring and autumn migra-



WHIMBREL

tion, occasionally breeding in the Shetland Islands. It resembles the curlew but is smaller, and has a proportionately shorter bill; length of male 16 inches, female somewhat larger; plumage bright ash color, with streaks of brown on neck and breast; a band of yellowish white on middle of head, with a wider brown band on each side; belly and abdomen white; feathers of back and scapulars deep brown in the middle, bordered with brighter brown; tail ashy brown, with oblique brown bands; bill blackish, inclining to red at base; feet lead color. Its flesh is esteemed for the table, and its eggs are as highly valued as those of the plover. See CURLEW.

WHIPPLE, EDWIN PERCY, an American literary critic; born in Gloucester, Mass., March 8, 1819. He published: "Essays and Reviews" (2 vols. 1848-1849); "Lectures on Subjects connected with Literature and Life" (1849); "Character and Characteristic Men" (1867); "The Literature of the Age of Elizabeth" (1868); "Success and its Conditions" (1871); and posthumously published "Recollections of Eminent Men" (1887); "American Literature and Other Papers" (1887); and "Outlooks on Society, Literature, and Politics" (1888). He died in Boston, June 16, 1886.

WHIPPOORWILL, in ornithology, *Caprimulgus* (*antrostomus*) *vociferus*, a goat-sucker common in the E. parts of the United States; about 10 inches long; plumage tawny brown, much mottled and indistinctly marked with small transverse bands; top of the head streaked with black, and a narrow white collar on throat. The popular name of the bird is derived from the cry, which bears some resemblance to these words. The habits of the bird are like those of the European goatsucker.

WHISKEY, an ardent spirit, distilled generally from barley, but sometimes also from wheat, rye, sugar, molasses, etc. There are two varieties—viz., malt whiskey and grain whiskey. The former is of finer quality, and made principally from malted barley and sometimes, though rarely, from rye. The latter is cheaper but stronger, and is made from various substances, as sugar, molasses, potatoes, but principally from unmalted grain, as Indian corn, barley, oats, etc., dried and ground up. If kept sufficiently long, it is equal in quality to malt whiskey.

WHISKEY INSURRECTION, the name given to a local outbreak occurring in opposition to the excise law passed by Congress, March 3, 1791. In addition to the general objections urged against the measure, the inhabitants of western Pennsylvania considered the tax an unfair discrimination against their region and raised an insurrection, causing President Washington to call out an army of 15,000 militia. This show of an unsuspected vigor and resource on the part of the Government forced the insurgents to disperse without bloodshed.

WHIST, a game of cards, so called from the silence necessary to play it attentively and correctly. It was formerly also called whisk. It is played by 4 persons, 2 of whom are partners against the other 2. The full pack of 52 cards is used, 13 being dealt one at a time to each player in order, the dealer beginning with the player on his left. The last card dealt is turned face up on the table, and is called the trump card; the suit to which it belongs has for the hand the privilege of taking or being superior to any card of any other suit. The cards rank in value as follows: Ace (the highest), king, queen, knave, 10, 9, 8, and so on. The game is commenced by the player on the left hand of the dealer laying one card face upward on the table, this being called leading off; the player on his left then plays a card of the same suit (if he has one), and is followed similarly by the player on his left. When all have played, the person who has played the highest card takes up the 4 cards played, these constituting what is termed a trick. If a player has no card of the suit led off, he may play one of any other suit. The winner of the first trick then leads off with any card he pleases for the second trick, the winner of which becomes the leader of the third trick, and so on. The score is taken as follows when the hand is played out; the partners who conjointly have won the majority out of the 13 tricks, score one point for every trick over 6. The ace, king, queen, and knave are called honors, and the partners who hold between them 3 of these cards score 2 points, and if they hold all of them they score 4 points; this is technically known as scoring 2 (or 4) by honors. If each side holds two of these cards, honors are said to be divided or easy. In long whist (now becoming obsolete) 10 points make a game, in short whist only 5 points are required, and in this it is usual to count by tricks alone. A rubber consists of 3 games, and is won by the partners who score 2 of them. If one side wins the first 2 games the third is not played out. There are several modifications of the game, such as solo whist, three-handed whist, bridge whist, compass whist, military whist, duplicate whist, etc.

WHISTLE FISH, *Motella tricirrhata*, the three-bearded rockling. Pennant says the name was applied to the fish because "the Cornish fishermen whistle when desirous of taking this fish, as if by that they facilitate its capture."

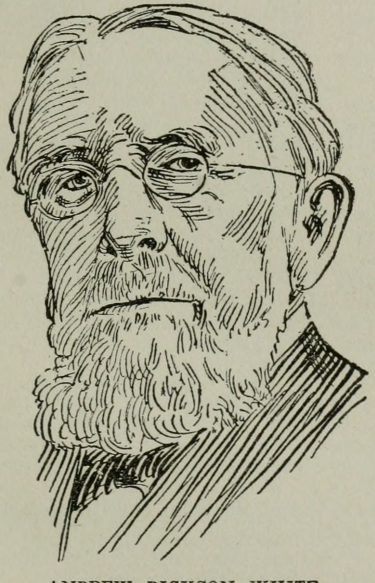
WHISTLER, JAMES ABBOT MCNEILL, an American painter; born in Lowell, Mass., in 1834; studied for a time at the United States Military Academy; next went to Paris, worked for two years in the studio of Gleyre, and afterward settled in London. In 1884 he became a member of the Society of British Artists, of which he was president from 1886 to 1889. In France he received a medal (3d class) at the Salon of 1883, a gold medal at the Exposition of 1889, and was "Hors Concours" at the Salon in 1892; and he was made Chevalier (1889) and Officer (1891) of the Legion of Honor. In 1889 he was elected a member of the Munich Academy, and received the Cross of the Order of St. Michael; and in 1900 he took the highest prize at the Exposition Universelle, in Paris.

In 1859 he began to exhibit in the Royal Academy, showing "Two Etchings from Nature," which were followed in 1860 by five dry-point portraits and etchings of Thames subjects, and an oil picture of a mother and child "At the Piano." He exhibited frequently in the Salon, the Academy, the Grosvenor Gallery, the Society of British Artists, and in 1874 and 1892 held exhibitions of his paintings in London.

The finest of his oil pictures are "The Artist's Mother—an arrangement in Black and Gray," shown in the Royal Academy of 1872, awarded a gold medal in the Salon of 1884, and purchased for the Luxembourg Gallery in 1891; the "Portrait of Thomas Carlyle," shown in the artist's exhibition of 1874, and purchased by the Glasgow Corporation in 1891; and the "Portrait of Miss Alexander—Harmony in Gray and Green." In addition to many other portraits, such as those of Señor Sarasate, Miss Rosa Corder, Irving as Philip II., and Lady Archibald Campbell, he produced some fascinating figure subjects and views on the Thames, etc., in oils. He was also a skillful worker in pastels on tinted paper; while as a purely decorative artist he is known by the "Peacock Room," painted in 1877 in Mr. Leyland's house at Prince's Gate, London, and by the "Music Room," in Señor Sarasate's residence in Paris. His etchings include: "The French Set," (13 subjects, Paris, 1858); the "Thames Set" (16 subjects, London, 1871); the "First Venice Set" (12 plates, London, 1880); the "Second Venice Set" (26 plates, 1886). Whistler's art is original and individual. On Feb. 11, 1902, the Philadelphia Academy of Fine Arts awarded him its Gold Medal of Honor. Whistler was one of the greatest painters of the later 19th century. He died in London, England, July 17, 1903.

WHITBY, a seaport and market-town of England, in the North Riding of Yorkshire; on the Esk river, which forms the harbor, and is crossed by a swing bridge; 16 miles from Scarborough. It has dockyards for the building of ships, and commodious dry docks. Jet is collected here. Whitby was several times bombarded by German cruisers during the World War. Pop. about 12,000.

WHITE, ANDREW DICKSON, an American diplomatist; born in Homer, N. Y., Nov. 7, 1832. He was graduated at Yale in 1853; traveled in Europe; studied at Sorbonne and Collége de France, 1853-1854; attaché to legation of the United States, St. Petersburg, 1854-1855; studied in the University of Berlin, 1855-1856; Professor of History and



ANDREW DICKSON WHITE

English Literature University of Michigan, 1857-1863; returned to Syracuse and elected State Senator, in which capacity (1863-1867) he introduced reports and bills codifying the schools laws, creating a new system of normal schools, establishing a new health board in the city of New York, and incorporating Cornell University at Ithaca; chosen first president of that university, 1866; visited Europe to purchase books and apparatus therefor, and make special study of European educational methods; has in addition to the presidency filled the chair of modern history; was appointed by President Grant commissioner to Santo Domingo to study and report on question of annexation, 1871; by the State of New York commissioner to Paris Exposition, 1878; by President Hayes minister to Berlin, 1879-1881; by President Harrison minister to St. Petersburg, and continued under President Cleveland, 1892-1894; appointed by President Cleveland member of the Venezuelan Commission, 1895-1896; ambassador to Berlin under President McKinley, 1897; president of the American delegation to the International Peace Congress at The Hague in 1899. Mr. White was a regent of the Smithsonian Institution and an officer of the Legion of Honor of France. His principal works are: "The Warfare of Science" (1876); "History of the Warfare of Science with Theology in Christendom" (1897); "European Schools of History"; "The New Germany"; "The Work of Benjamin Hale" (1911). He died in 1918.

WHITE, EDWARD DOUGLAS, an American jurist; born in the parish of Lafourche, La., Nov. 3, 1845; was educated at Mount St. Mary's College, Md., and at the Jesuit College in New Orleans. During the Civil War he served in the Confederate army. After the war he practiced law. He was State Senator of Louisiana in 1874; associate justice of the Supreme Court of Louisiana in 1878; and United States Senator in 1889-1894. While still in the Senate he was appointed an associate justice of the United States Supreme Court and became Chief Justice on the death of Melville W. Fuller in 1910.

WHITE, GILBERT, an English naturalist; born in Selborne, England, July 18, 1720. He wrote: "The Natural History and Antiquities of Selborne in the County of Southampton" (1789); and a posthumous work edited from his papers, "The Naturalist's Calendar, with Observations in Various Branches of Natural History" (1795). Many naturalists have published editions of his works with annotations. John Burroughs wrote an introduction to the edition of 1895. His "Letters" were published in 1876. He died in Selborne, June 20, 1793.

WHITE, HENRY, an American diplomat and public official, born in Baltimore, Md., in 1850. He was educated in private schools in the United States and France, and took post-graduate studies at Harvard and Johns Hopkins. He entered the diplomatic service and was secretary of the American Embassy at London, from 1884 to 1905. He acted many times as chargé. In 1887-1888 he represented the United States at the International Conference for the abolition of sugar bounties, and also took part in many

other international conferences, including the Algeciras Conference respecting Moroccan affairs in 1906. In 1905 he was appointed American Ambassador to Italy, and in 1907 was appointed Ambassador to France, serving until 1909. In 1910 he was chairman of the American delegation to the Fourth Pan-American Conference. He was selected by President Wilson as the Republican representative on the United States delegation to the Peace Conference in Paris in 1919.

WHITE, HENRY KIRKE, an English poet, born in Nottingham, England, March 21, 1785; was the son of a butcher, and being of a delicate constitution he was put to the trade of stocking weaving. From his infancy he manifested great love of learning, and at the age of 14 produced some notable specimens of poetry. He published, in 1803, a poem called "Clifton Grove"; and after his death his "Remains," consisting of poems, letters, etc., were edited by Southey. He died in Cambridge, England, Oct. 19, 1806.

WHITE, HORACE, an American editor; born in Colebrook, N. H., Aug. 10, 1834. He settled in Chicago, was editor of the Chicago "Tribune" (1864-1874); and subsequently became connected with the New York "Evening Post." He wrote many pamphlets and essays on political, social, and financial topics, the best known being: "The Silver Question"; "The Tariff Question"; "Coin's Financial Fool"; "Money and Banking Illustrated by American History"; "The Gold Standard"; "Life of Lyman Trumbull" (1913); and edited Bastiat's "Sophismes Économiques" (1876) and Cossa's "Scienza delle Finanze" (1889). He died in 1916.

WHITE, RICHARD GRANT, an American Shakespearean scholar; born in New York City, May 23, 1822. His journalistic work was in connection with the New York "Courier and Enquirer" (1851-1858), and "World" (1860-1861); and the London "Spectator" (1863-1867), for which he wrote "Yankee Letters." Among his published books are: "Biographical and Critical Handbook of Christian Art" (1853); "Shakespeare's Scholar" (1854); "National Hymns: A Lyrical and National Study for the Times" (1861); "Memoirs of the Life of William Shakespeare, with an Essay Toward the Expression of His Genius," etc. (1865); "Poetry of the Civil War" (1866); "Words and Their Uses" (1870); "England Without and Within" (1881); "The Riverside Shakespeare," with Biography, introductions and notes (1883, 3 vols.); an annotated edition of Shakespeare, (1857-1865, 12 vols.). He published one novel, "The Fate of Mansfield Humphreys" (1884). He died in New York City, April 8, 1885.

WHITE, STEWART EDWARD, an American author, born in Grand Rapids, Mich., in 1873. He was educated at the University of Michigan and at the Law School of Columbia University. He was a member of the American Institute of Arts and Letters and of the American Association for the Advancement of Science, and a fellow of the Royal Geographical Society of London. During the World War he served as a major with the 144th F. A. Besides contributing to many of the most prominent magazines, he wrote "Westerners" (1901); "Claim Jumpers" (1901); "The Blazed Trail" (1902); "Conjuror's House" (1903); "The Forest" (1903); "The Magic Forest" (1903); "The Silent Places" (1904); "The Mountains" (1904); "Blazed Trail Stories" (1904); "The Pass" (1906); "The Mystery" (with Samuel Hopkins Adams, 1907); "Arizona Nights" (1907); "Camp and Trail" (1907); "The Riverman" (1908); "The Rules of the Game" (1909); "The Cabin" (1910); "The Adventures of Bobby Orde" (1911); "The Land of Footprints" (1912); "African Camp Fires" (1913); "Gold" (1913); "The Rediscovered Country" (1915); "The Gray Dawn" (1915); "The Leopard Woman" (1916); "Simba" (1918); "The Forty-Niners" (1918).

WHITE, WILLIAM ALLEN, an American journalist, born in Emporia, Kan., in 1868. He was educated at the University of Kansas. In 1895 he became proprietor and editor of the Emporia "Daily and Weekly Gazette." He was a member of the National Institute of Arts and Letters, vice-president of the American Short Ballot Association, and a trustee of the College of Emporia. A Republican in politics, he was one of the chief supporters of ex-president Roosevelt in the formation of the Progressive party, becoming a member of its National Committee and the chairman of its publicity committee. During the World War he went, in 1917, to France as an observer for the American Red Cross. In 1919 he was appointed an American delegate to the Russian Conference at Prinkipo. Besides contributing frequently to magazines and newspapers, he wrote "The Real Issue and Other Stories" (1896); "The Court of Boyville" (1899); "Stratagems and Spoils" (1901); "In Our Town" (1906); "A Certain Rich Man" (1909); "The Old Order Changeth" (1910); "God's Puppets" (1916); "In the Heart of a Fool" (1918); "The

Martial Adventures of Henry and Me" (1918).

WHITEBOYS, the name of an illegal association formed in Ireland about 1760. The association consisted of starving day laborers, evicted farmers, and others in a like condition, who used to assemble at nights to destroy the property of harsh landlords or their agents, the Protestant clergy, the tithe collectors, or any others that had made themselves obnoxious in the locality. In many cases they did not confine their acts of aggression merely to plunder and destruction, but went the length of murder.



WILLIAM ALLEN WHITE

WHITE CHAPEL, a celebrated parish of London, England, where the mysterious "Jack the Ripper" operated in 1888-1891. It contains the London Hospital and the Tower of London, and has a population of about 30,000.

WHITEFIELD, GEORGE, an English clergyman; born in Gloucester, England, Dec. 16, 1714. At the age of 18 he entered as servitor at Pembroke College, Oxford, where he became acquainted with the Wesleys, and joined the small society which procured them the name of Methodists. He was ordained deacon in 1736, and soon became very popular as a preacher. In 1738 he went to the American settlement of Georgia, where his ministrations gave great satisfaction to the colonists. In the following year he returned to England to procure subscriptions for building an orphan house in the settlement. Having taken priest's orders, he repaired to London, where the churches in which he preached proved incapable of holding the crowds who assembled to hear him. He now adopted preaching in the open air, and visited various parts of the country, addressing vast audiences. In 1739 he again embarked for America, and made a tour through several of the provinces, preaching with great effect to immense crowds. He returned to England in the following year, where for a time differences between him and Wesley deprived him of many followers. After visiting many parts of England, Scotland, and Wales he again returned to America, and remained there nearly four years. Soon after his return he was introduced to the Countess of Huntingdon, who made him one of her chaplains. A visit to Ireland and two more voyages to America followed, and for several years his labors were unremitting. He was the founder of the Calvinistic Methodists. At length, on his seventh visit to America, he died in Newburyport, Mass., Sept. 30, 1770. See METHODISM: WESLEY.

WHITE FRIARS, a popular name in pre-Reformation times for the friars of Our Lady of Mount Carmel, now generally known as Carmelites. The name had reference to the fact that they wore over the brown habit a white scapular and cloak. See CARMELITE.

WHITEHAVEN, an important mining center and seaport of Cumberland, England; on a level inlet between precipitous cliffs; 38 miles S. W. of Carlisle, and 10 miles from Workington. The town contains numerous churches belonging to the various Protestant denominations, several schools, a mechanics institute, a library, public baths, etc. There are manufactures of coarse cloth, earthenware, soap, etc., but the prosperity of the town is chiefly due to the immense seams of coal and of hæmatite iron ore in its vicinity, some of which are wrought a distance of two miles under the sea. There are also large rope works and shipbuilding yards. Pop. about 20,000.

WHITEHEAD, WILLIAM, an English poet; born in Cambridge, England, in 1715. He was educated at Winchester and Cambridge, was secretary and register of the Order of the Bath, and became poet-laureate in 1757, succeeding Colley Cibber. He wrote: "The Roman Father," a tragedy; "The School for Lovers," a comedy; and other dramas and poems. He died April 14, 1785.

WHITE HOUSE, a name applied to the presidential mansion in Washington,

D. C. The name arose from the fact that it is built of stone and painted white. The total length is 170 feet; depth 86 feet; height two stories, with a portico, containing the main entrance on the N. side. The corner stone was laid in 1792; the house was first occupied by President Adams in 1800; burned by British troops in 1814; and restored in 1818. By metonymy the name has been applied to the office of the presidency itself. There are several other mansions and plantations in the Southern States which have borrowed this title.

WHITE LADY, a spectral figure which, according to popular legend, appears in many of the castles of Germany, as at Berlin, Neuhaus in Bohemia, Ansbach, Bayreuth, Kleve, Darmstadt, Altenburg, as also in London, Copenhagen, Stockholm, and elsewhere, by night as well as by day, particularly when the death of any member of the family is imminent. She is regarded as the ancestress of the race, shows herself always in snow-white garments, carries a bunch of keys at her side, and sometimes rocks and watches over the children at night when their nurses sleep.

WHITE LEAD, a dense white powder, insoluble in water, but easily dissolved in dilute nitric or acetic acid; extensively employed in painting.

WHITE MOUNTAINS, a mountain chain of New England, regarded as an outliner of the Appalachian range, commences at the head waters of the Aroostook river, in Maine, where its first summit is Mount Katahdin, and extends in a broad plateau, from 1,600 to 1,800 feet high nearly across New Hampshire, where it has 20 bold peaks, with deep narrow gorges, wild valleys, beautiful lakes, lofty cascades and torrents, forming the "Switzerland of America," and a favorite resort of summer tourists. Mount Washington is the highest summit in New England. The other peaks of White Mountains proper are Mount Madison, Mount Clay, Mount Jefferson, Mount Monroe, and Mount Adams. In the Franconia group are Lafayette and Moose Hillock. These mountains furnish the chief sources of the Connecticut, Merrimac, and Androscoggin rivers. The rocks are ancient metamorphic, with naked granite and gneiss. There are five "notches," or passages through the mountains: the White Mountain notch, through which the Saco river passes; the Franconian notch, which permits the passage of the Pemigewasset; the Pinkham notch, and the Grafton and Dixville notches, through which flows the Androscoggin. A carriage road has been constructed to the summit of Mount Washington on the E. side, and a railroad on the W. side, the latter completed in 1869. The White Mountains were first visited by white men in 1642, but no settlements were made in the region till about 1771. Since 1868 the mountains have been explored by the New Hampshire Geological Survey. There is a meteorological station on the summit of Mount Washington.

WHITE PLAINS, a town in Westchester co., N. Y.; 26 miles N. N. E. of New York City. It was the scene of several important events during the Revolutionary War, the most prominent of which was the action usually known as the battle of White Plains, though it actually occurred in the town of Greenburg, on the opposite side of the Bronx river, Oct. 28, 1776. After a warm contest, the commanding eminence of Chatterton Hill, on which the Americans under Washington were intrenched, was carried by the British under General Howe, the Americans retreating in good order and without being pursued. The loss on each side was about 300 killed, wounded, and prisoners. Pop. (1910) 15,949; (1920) 21,031.

WHITE RIVER. (1) A river of Arkansas, with a course of 800 miles. It joins the Mississippi above the influx of the Arkansas river, and has several important affluents. Together with its tributaries it affords 500 miles of boat navigation. (2) A river in Indiana, formed by the confluence of the East and West Forks, emptying into the Wabash near Mount Carmel. (3) A river of Canada, an affluent of the Yukon. It rises in the coast mountains near the head of Altsekh river; flows for over 200 miles through a rough country in a N. E. direction; and enters the Yukon just above the mouth of the Stewart. Some gold has been found along its course.

WHITE RUSSIA, a name given by the people to that part of Russia lying toward the W. and principally inhabited by White Russians.

WHITE SEA, a branch of the Arctic Ocean which extends S. W. into the province of Archangel as far as the 64th parallel. It is separated from the open sea by the peninsula of Kola and a strait 246 miles long, and from 106 miles (between Capes Sviatoi and Kanin) to 28 wide, and divides itself for the most part into three bays, of which the broadest is the Dwina Bay to the S. E., the S. the Onega Bay, and the longest the Kandalak Bay in the W. Its area, including the N. E. bay, into which the

Mezen falls, is 47,346 square miles. The coasts are flat, with numerous lakes, small rivers, and mountains in the N. and E. The White Sea is blocked with ice except during the months of June, July, and August. Canals connect it with the Volga and the Dnieper. The dwellers on its shores are Lapps, Finns, and Samoyedes, who live by fishing, seal hunting, and the chase. The chief port is Archangel. The passage to the White Sea was discovered in 1553 by Richard Chancellor, an officer under Sir Hugh Willoughby. The English in 1584 established the little fort of Archangel as the center of the White Sea trade, in which they enjoyed great privileges till the founding of St. Petersburg.

WHITING, a city of Indiana, in Lake co. It is on the Elgin, Joliet and Eastern, the Indiana Harbor Belt, the New York Central, the Pere Marquette, the Baltimore and Ohio, and the Pennsylvania railroads. Its industries include the manufacture of oilcloth, chemicals, asphalt pavement, etc. It has a public library and a park. It is an important station of the Standard Oil Company. Pop. (1910) 6,587; (1920) 10,145.

WHITING, LILIAN, an American author; born in Niagara Falls, N. Y., Oct. 3, 1859. She was literary editor of the Boston "Traveler" in 1880-1890, and editor of the Boston "Budget" in 1890-1894. She then traveled in Europe. Her publications include: "The World Beautiful" (3 vols.); "From Dreamland Sent" (poems); "After Her Death"; "The Story of a Summer"; "A Study of the Life and Poetry of Elizabeth Barrett Browning"; "Kate Field: a Record"; "The Spiritual Significance"; etc.

WHITLOCK, BRAND, an American writer and diplomat; born in Urbana, O., in 1869. After a common school education he entered the field of journalism in Toledo, O., but, in 1890, went to Chicago to join the staff of the Chicago "Herald." Three years later he became a clerk in the office of the secretary of state of Illinois. During this period he studied law and was admitted to the bar of Illinois in 1894 and, in 1897, to the bar of Ohio. He began to practice law in Toledo, where he was elected mayor in 1905, being re-elected to the same office for three other terms. Under his administration a new charter was granted the city and such innovations as the initiative, the referendum, the recall of public officials, and direct nominations were instituted. Meanwhile he was also becoming known as a regular contributor to major American magazines, both as a writer of verse and of prose articles. In 1913 he was appointed Minister to Belgium, where he distinguished himself for his expert handling of the situation during the World War. War having been declared against Germany by the United States in April, 1917, Mr. Whitlock was recalled, but after the signing of the armistice and the restoration of the Belgian Government, he returned to Brussels as Ambassador. Among his many works are: "Her Infinite Variety" (1904); "The Gold Brick" (1910); "Belgium, a Personal Narrative" (1919).

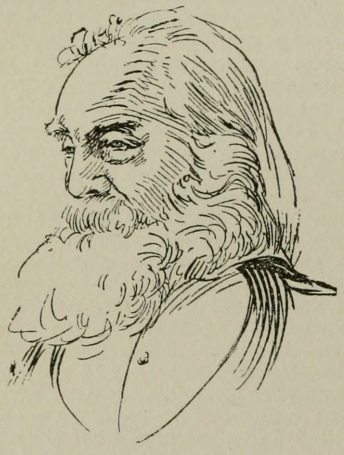
WHITMAN, CHARLES SEYMOUR, an American public official, born at Norwich, Conn., in 1868. He graduated from Amherst College in 1890. After admission to the bar, he practiced in New York City. From 1901 to 1903 he was assistant corporation counsel, and from 1904 to 1907 was a city magistrate. He was appointed judge of the Court of Special Sessions in 1907, and from 1910 to 1914 was district attorney of New York county. In 1914 he was elected governor of New York. He was re-elected in 1916.

WHITMAN, MARCUS, an American pioneer; born in Rushville, N. Y., Sept. 4, 1802. In 1836 he emigrated with a number of others to work as a missionary among the Indians of the Upper Columbia. Accompanied by his young wife he crossed the plains by wagon, being the first person to reach the Pacific by this means. He was soon followed by a large number of emigrants who settled in what was then known as Oregon, and which now forms the States of Oregon, Washington, and Idaho. At this time the Hudson's Bay company were using every possible means to secure this territory to the English. When this plan became evident to Dr. Whitman he decided to take every precaution to forestall it. The Ashburton-Webster treaty was then before Congress and was expected to settle the Oregon question. Knowing that the Government should have full information as to the true state of affairs, Whitman rode over 3,000 miles on horseback, enduring all the hardships of a Western winter in the mountains, and reaching Washington on March 3, 1843, only to find that the treaty had been signed. Fortunately the Oregon question had not been included. Dr. Whitman at once went to work and taught the Government the value of the land it had deemed worthless, demonstrated to the people the fertility of the soil of Oregon, and the fact that it could be reached by wagon, and then returned at the head of 1,000 emigrants. By his

daring ride and his earnest endeavors Dr. Whitman won this great section for the United States, and the results of his work were secured by the treaty of 1846. In 1847, with his wife and some others, he was massacred by the Cayuse Indians.

WHITMAN, SARAH HELEN POWER, an American poet; born in Providence, R. I., in 1803. She married John W. Whitman, a Boston lawyer; was once engaged to Edgar Allan Poe, afterward writing a defense of him entitled "Edgar A. Poe and his Critics" (1860); and was noted for her conversational powers. She published several volumes of poems, among them being the volume "Hours of Life, and Other Poems" (1853); also "Fairy Ballads," written with her sister, Anna M. Power. She died in Providence, R. I., June 27, 1878.

WHITMAN, WALT, an American poet, born at West Hills, Long Island, May 31, 1819. His education was obtained under difficulties and was not extensive. From twelve years of age he worked for his living, chiefly in printing shops, and soon began to try his hand at writing. He became one of the editors of the Brooklyn "Daily Eagle," and in 1848 he went to New Orleans, where he



WALT WHITMAN

worked on the "Crescent." He returned to Brooklyn in 1850, most of the way on foot, by the Great Lakes, thus he saw at first hand the great variety of the States and came into contact with all sorts of people, laying up material on which much of his future poetry was to be based. He was fascinated by people, masses of them as seen on a Brooklyn ferry or the New York streets, or lonely hunters and trappers, pioneers in the Western wilderness.

In 1855 these meditations and observations bore fruit in the first edition of "Leaves of Grass," henceforth to be the chief interest of his life and the receptacle for all his most characteristic work. A second edition appeared in 1856, a third in 1860, and others in succession until 1891. In each new edition further material was added. In these poems Whitman departed widely from conventional American poetry both in subjects and in form. His theme may be defined as an attempt to realize the complexity of ordinary American life through his own personal experience, both real and in imagination. More than others of our poets he has expressed a conception of democracy, not as affording opportunity for the development of individuals, nor yet as crystallized in institutions, but as *mass*. The countless multitudes, living and yet to live, that make up the population of these States, he visualizes in many forms—the pioneers, marching resistlessly to their conquest of lands yet uninhabited; the crowds on the ferry or in the city streets; men and women of all occupations in every part of the country. It is the average man, he says, that he sings; his physical life, his religion, his capacity for friendship. In "the dear love of comrades" he found argument for the coming of a time when wars shall cease and a new golden age be ushered in. Life seemed good to him, all of it, and he spoke with a frankness that has given offense to many. Of himself he speaks much, meaning not merely himself as a type of the average man, but as a personification of all men. He also has a vivid sense of the eternal succession of the generations of the immortality of the race.

While some of Whitman's poems have rhyme, metrical regularity, and stanzas of the usual types, these are not his most characteristic writings. He speaks of them as chants. They are divided into highly rhythmical units, without rhyme, varying in length of lines, held together by some pattern or cadence. In so great a mass of poetry there must be passages that are prosaic, mere catalogues. But there is also abundance of poetry of marvelous variety and beauty. Poems like "When Lilacs Last in the Dooryard Bloomed" or "Out of the Cradle Endlessly Rocking," though differing widely in form and structure from the older English tradition, are instantly felt to be creations of supreme beauty. But he uses little narrative; he is unable or unwilling to give the little pictures of simple life that we find in Whittier, in Riley, and other poets who have phrased the thoughts and lives of the multitude of ordinary men and women; he lacks

the expression of simple religious faith and household virtues that we find in Longfellow; and he uses difficult, unusual, often bizarre diction, so that though he sets up the claim to be the poet of democracy he has never found wide audience among the people whom he wished to represent.

Whitman's wide sympathy for all sorts and conditions of men was quickened by experience during the Civil War. He became a hospital nurse in Washington. In his prose "Specimen Days" he has recorded many of his experiences. Others found verse form in a collection named "Drum Taps." This whole experience was summed up in the series of poems that he wrote on the death of Lincoln, whom he tenderly loved. These portions of his work reveal the kindness and human sympathy of the man, the beauty of humble service rendered to suffering boys on both sides of the great conflict, a deep pathos mingled with "Clear notes of faith and triumph." In "Democratic Vistas," a collection of prose pieces, he put his thoughts about America and her destiny, themes also found in "Leaves of Grass." His vivid sense of the two laws of individuality and comradeship, the keynote of his poetry, finds, when applied to his theory of the nation, a counterpart in his doctrine of the sacred individuality of the States, or separate units, as merged in the larger personality of the nation. This idea he develops mystically and with great earnestness; it becomes the means by which he prophesies a higher evolution in which the nations of men shall be as the states in a larger union, a league of nation-states, uniting all the world in a common brotherhood. "Great as they are," he says, "and greater far to be, the United States, too, are but a series of steps in the eternal process of creative thought."

Whitman's rise to fame was slow. As was to be expected in the case of one who so openly flouted convention, he was alternately derided and made the basis of a cult. The poems were recognized sooner in Europe than in America. But gradually his fame has increased. His peculiarities of diction and form, his inequality, his constant repetition, his need of revision and compression, seem less important as the propheti: elements of his work become more apparent. Since his death, at Camden, N. J., in 1892, his circle of readers has constantly increased.

WHITMAN COLLEGE, an institution for higher education, founded at Walla Walla, Washington, in 1859. It has an endowment of about $1,000,000. In 1919 there were 25 instructors and 310 students. President, S. B. L. Penrose, D. D.

WHITNEY, ADELINE DUTTON (TRAIN), an American author; born in Boston, Mass., Sept. 15, 1824. Besides writing a great deal for magazines, she published: "Footsteps on the Seas: A Poem" (1857); "Mother Goose for Grown Folks" (1860; revised ed. 1882); "The Boys at Chequasset" (1862); "Faith Gartney's Girlhood" (1863); "The Gayworthies: A story of Threads and Thrums" (1865); "A Summer in Leslie Goldthwaite's Life" (1866); "Patience Strong's Outings" (1868); "Hitherto: A Story of Yesterdays" (1869); "Real Folks" (1872); "Pansies" (1872), verse; "The Other Girls" (1873); "Sights and Insights" (1876); "Bonnyborough" (1885); "Homespun Yarns" (1887); and two volumes of poems, "Bird Talk" (1887) and "Daffodils" (1887); "Square Pegs." She died March 20, 1906.

WHITNEY, ELI, an American inventor; born in Westboro, Mass., Dec. 8, 1765; was graduated at Yale College, in 1792, where he paid his expenses partly by school teaching, partly by mechanical labor. He went to Georgia as a teacher, but finding a generous patron in the widow of General Greene, of the Revolutionary army, he resided on her estate and studied law. The cotton culture at this period, especially that of the best kind, the "green seed," was limited by the slow and difficult work of separating the cotton from the seed by hand. Whitney set to work to remedy this under great disadvantages, for he had to make his own tools; but the reports of his success prompted some lawless people to break into his workshop and steal his machine, and get others made before he could secure a patent. He, however, formed a partnership with one Miller in 1793, and went to Connecticut to manufacture cotton gins; but the lawsuits in defense of his rights carried off all his profits and $50,000 voted him by the State of South Carolina. Finally in 1798 he got a Government contract for the manufacture of firearms, and was the first to effect the division of labor by which each part was made separately. He made a fortune by this manufacture, carried out with ingenious machinery at Whitneyville, Conn.; while he received little credit for the perfection of the gin, one of the most important of the whole series of inventions connected with the cotton manufacture. He died in New Haven, Conn., Jan. 8, 1825.

WHITNEY, JOSIAH DWIGHT, an American geologist; born in Northampton, Mass., Nov. 23, 1819; was graduated at Yale in 1839, and the year after joined the survey of New Hampshire. The years 1842-1847 he spent in study

in Europe, returning to explore, together with J. W. Foster, the Lake Superior region. Their "Synopsis" of the explorations was published in 1849; their "Report" on the geology, 1850-1851. Whitney next spent two years traveling in the States E. of the Mississippi, of which the fruit was "The Metallic Wealth of the United States" (1854). Appointed State chemist and professor in the Iowa State University in 1855, together with James Hall, he issued the "Reports" on its geological survey (1858-1859); and in 1858-1860 took part in the survey of the lead region of the Upper Missouri, publishing, again with Hall, his "Report" (1862). He was appointed State Geologist of California in 1860, and labored on the survey of that State till 1874, publishing in six volumes his "Geological Survey of California" (1864-1870). In 1865 he was appointed to the chair of geology at Harvard, received the LL. D. degree from Yale in 1870, and had the honor of giving his name to one of the highest mountains in the United States. His "Yosemite Guidebook" was published at San Francisco in 1869; his "Contributions to American Geology" in 1880; and his "Studies in Geographical and Topographical Nomenclature," in 1888. He died at Lake Sunapee, N. H., Aug. 18, 1896.

WHITNEY, WILLIAM COLLINS, an American capitalist; born in Conway, Mass., July 15, 1841; was graduated at Yale College in 1863, and at the Harvard Law School in 1865; studied law with Judge Abraham R. Lawrence in New York City, and was there admitted to the bar. He took an active part in the proceedings against the "Tweed Ring"; served as corporation counsel in 1875-1882; and was Secretary of the Navy in 1885-1889. For many years he was a large financial operator in New York City. He died in New York, Feb. 2, 1904.

WHITNEY, WILLIAM DWIGHT, an American educator; born in Northampton, Mass., Feb. 9, 1827; was graduated at Williams College in 1845; spent some years abroad in study; in 1854 was made Professor of Sanskrit at Yale, in 1870 of comparative philology, holding both positions till death. His writings are authority on all philological questions, and his rank as a Sanskrit scholar is of the first order. From 1849 he was a member of the American Oriental Society, and its president from 1884. His contributions to the "North American Review," the "New Englander," and other periodicals, were numerous and varied. His earliest work was the preparation, in company with Rudolf Roth of Tübingen, of an edition of the "Atharva Veda Sanhita" (Berlin, 1856). Among his other works are: "Language and the Study of Language" (1867); "On Material and Form in Language" (1872); "Darwinism and Language" (1874); "Logical Consistency in Views of Language" (1880); "Mixture in Language" (1881); "The Study of Hindoo Grammar and the Study of Sanskrit" (1884); "The Upanishads and their Latest Translation" (1886). He has also written "Compendious German Grammar" (1869); "German Reader in Prose and Verse" (1870); "Essentials of English Grammar" (1877); "Sanskrit Grammar" (1877); and "Practical French Grammar" (1886). Professor Whitney was the superintending editor of the "Century Dictionary" (1889-1891), and assisted in the preparation of "Webster's Dictionary" (1864). He died in New Haven, Conn., June 9, 1894.

WHITNEY, MOUNT, one of the highest mountains of the United States; in the Sierra Nevada in southern California; height, 14,522 feet.

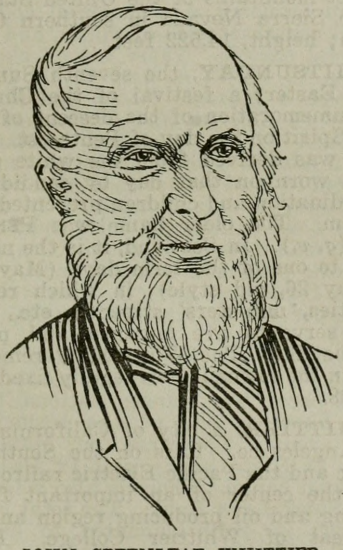
WHITSUNDAY, the seventh Sunday after Easter; a festival of the Church in commemoration of the descent of the Holy Spirit on the day of Pentecost. The name was derived from the white garments worn on that day by candidates for ordination and children presented for baptism. The older name was PENTECOST (*q. v.*). In Scotland, it is the name given to one of the term days (May 15, or May 26, old style), in which rents, annuities, ministers' stipends, etc., are paid, servants are engaged and paid, and the like. The Whitsunday removal term in the towns is now legally fixed for May 28.

WHITTIER, a city of California, in Los Angeles co. It is on the Southern Pacific and the Pacific Electric railroads. It is the center of an important fruit growing and oil producing region and is the seat of Whittier College. Pop. (1910) 4,550; (1920) 7,997.

WHITTIER, JOHN GREENLEAF, an American poet, born in East Haverhill, Mass., in 1807. His childhood was spent on the farm, with few comforts and an amount of physical work that impaired his health. He had no schooling beyond a period of little more than a year in the academy at Haverhill. He had access to few books. When he was fourteen, the village teacher brought a volume of Burns to the Whittier house, and read the poems of the Scottish plowboy to a lad whose life was closely similar. At eighteen he wrote a poem which was published in William Lloyd Garrison's paper and led to a life-

long friendship. About a hundred of his poems appeared in the local newspaper in 1827-1828. Meantime he earned a little money from his trade, shoemaking, and by teaching in a country school. In 1828 he secured a position in Boston on the "American Manufacturer," and showed by some papers that he wrote his sense of the dignity of labor and of the way in which men were being exploited in industry. After a few months he became editor of the Haverhill "Gazette," changing six months later to the Hartford "Courant." He became interested in politics, and was elected to the Massachusetts legislature, but since he soon became identified with Garrison's anti-slavery propaganda his political career did not prosper.

In 1837-1838 he published two volumes of verse, "Ballads," and "Anti-Slavery Poems," that attracted wide attention. Before long he gave up all editorial and



JOHN GREENLEAF WHITTIER

political work and settled down to writing at his home at Amesbury, not far from Haverhill. His patriotic and anti-slavery poems were widely used, and are marked by simple and sincere feeling, but his poems about New England rural life possess a value beyond them. His was a voice as authentic as Bryant's and it possessed an accent of locality which the elder poet's lacked. In the numerous poems, frequently collected into small volumes, that he published through the remainder of his life both elements persist. In the first group belong "Toussaint L'Ouverture," "Expostulation," "The Virginia Slave Mother," the "Pastoral Letter," and, in later years, "Ichabod," in which he attacked Webster for his seventh of March speech (1850), "Barbara Frietchie," "Laus Deo." In the second belongs a group of ballads, "Songs of Labor," "Home Ballads," such idyls as "Maud Muller" and "Telling the Bees," and the immortal "Snow Bound" (1866). His fame grew slowly; not until the appearance of the last named poem did his work bring him any appreciable income. He traveled little, remaining throughout his life identified with a small part of Massachusetts soil, but from it seeing a life that he translated into songs that will not die. His last years were full of honor. He became identified with the group that made the "Atlantic" a power in American literature. When he died, September 7, 1892, in his eighty-fifth year, Holmes was the only one of the New England group who remained to write a memorial stanza.

Whittier's themes fall into four main classes: Poems dealing with slavery and national questions; nature poems, of which some are based on direct observation of the life about him while others, somewhat more artificial in style, are idyls of a pastoral type; a group expressive of simple and direct religious experience, the fruit of his Quaker faith, some of them hymns of high quality; and, lastly, ballads that are not literary imitations of folk ballads, such as Longfellow wrote, but which give the ballad spirit very accurately. In some of these poems, notably the political and propagandist work, we are moved by the intensity of his feeling about the evils he saw in American life and politics; in others, the nature group and the poems of religious experience, we find quietness and restraint. Yet all of them spring from the direct simplicity of his nature, "Ichabod" as fully as "Maud Muller" and the "Barefoot Boy." He did not understand Webster or his purposes; he saw only what he regarded as compromise with evil; his passionate intensity springs from the same sources as the songs of labor and rural life.

Whittier interests us for his variety in stanza and meter. He wrote no sonnets; he used few of the traditional forms. In "Barefoot Boy" he gets new effects from the four-accent couplet; whatever he does he individualizes. He has few literary allusions; his diction is homely, even inexact at times. He reminds us of Burns, but he does not imitate Burns. His work was his own, a precious strand in the weaving of an American poetry.

WHITTINGTON, RICHARD, an English magistrate; born in Pauntley,

England, about 1358; youngest son of Sir William Whittington. His father dying, Richard set out for London at 13 to push his fortune, and apprenticed himself to Sir John Fitz-Warren, a prosperous mercer, whose daughter he afterward married. He was a member of the Mercers Company in 1392, the year after an alderman and sheriff. In 1397 he was chosen mayor of London to fill the place of Adam Bamme who had died in his year of office, again in 1406, member of Parliament for the city in 1416, and in 1419 for the third time mayor. He was knighted by Henry V., and died in the spring of 1423, and by his will rebuilt Newgate and St. Michael's Church, connecting also a college and an almshouse with it, while he also restored St. Bartholomew's Hospital, gave a library to Grey Friars, and provided drinking fountains. The popular cat story attributed to him is not well authenticated.

WHITWORTH GUN, in ordnance, a wrought iron or, afterward, steel gun invented by Sir Joseph Whitworth. It had a hexagonal spiral bore, the angles of which were rounded off, and fired a projectile (sometimes called the Whitworth ball), the middle part of which fitted the bore, but the rear part tapered somewhat, and did not touch the rifling, while the point was rounded. Both muzzle-loading and breech-loading patterns were made. There was very little windage, and good ranges were obtained.

WHYMPER, EDWARD, an English traveler; born in London, England, April 27, 1840. He was famous as a mountain climber; was the first to ascend the Matterhorn and other great Alpine peaks; ascended several of the greatest of the Andes; and traveled in Greenland. He published, and himself illustrated, "Swiss Pictures" (1866); "Scrambles Among the Alps" (1869); "Travels Among the Great Andes of the Equator" (1892); etc. He died in 1911.

WHYTE-MELVILLE, GEORGE JOHN, an English novelist; born near St. Andrews, Scotland, in 1821. A captain in the Coldstream Guards, he retired from the army, in 1849, but served in the Turkish cavalry during the Crimean War. Among his works were: "Captain Digby Grand" (1853); "The Gladiators" (1863); "Sarchedon" (1871); "Katerfelto" (1875); etc. He wrote also a volume of "Songs and Verses" and translated Horace's Odes; etc. He died Dec. 5, 1878.

WICHITA, a city of Kansas, the county-seat of Sedgwick co., on the Arkansas river and on the Atchison, Topeka and Santa Fe, the Missouri Pacific, the Chicago, Rock Island and Pacific, and other railroads. It is the center of an important agricultural region and the milling of flour is one of the most important industries. Wichita is an attractive city and has many fine public buildings. There are 90 miles of paved streets, an excellent fire department, over 300 miles of sewer, 37 miles of street railway, and 145 miles of water mains. The park system comprises nearly 400 acres. Boating and bathing facilities are provided in Riverside Park, on the Little Arkansas river. There are 31 public school buildings, in which are enrolled over 13,000 pupils. There are 370 teachers. Two magnificent intermediate high schools, bearing the names of Mark Twain and Theodore Roosevelt, were erected in 1920. The institutions of higher learning include Fairmount College and Friends' University. There are also an academy, a commercial college, several conservatories of music, and five parochial schools. There are 57 church edifices, Y. M. C. A. and Y. W. C. A. buildings, a Masonic Home, and Mount St. Mary's Convent and Orphanage.

Wichita is an important industrial center. Almost without exception fuel oil produced in local refineries is used by the manufacturing establishments. In addition to flour milling the chief industries are the manufacture of automobiles, beef and pork products, bridges, candy, elevators, furniture, harness, men's clothing, paper boxes, tractors, trunks, and wagons.

Wichita is an important live stock market. Two large packing plants are located here. The Kansas National Live Stock Show is one of the important yearly events. There are four National banks, 21 State banks, and 12 Federal farm loan banks. There is also a Guarantee Stock Land Bank. The total bank clearings in 1919 amounted to $604,202,200. Wichita was settled in 1870. Pop. (1910) 52,450; (1920) 72,217.

WICHITA FALLS, a city of Texas, the county-seat of Wichita co. It is on the Missouri, Kansas and Texas, the Wichita Valley, and the Fort Worth and Denver City railroads. It is an important industrial center, and has manufactures of automobile trucks, window glass, candy, stoves, pottery, etc. Pop. (1910) 8,200; (1920) 40,079.

WICK, the county-town of Caithness, Scotland; on the Wick river, at its entrance to Wick Bay; 161 miles N. N. E. of Inverness. Wick is one of the great centers of the herring fishery, and to this industry everything is subordinated.

There is some fine rock scenery in the neighborhood. Pop. about 8,000.

WICKERSHAM, GEORGE WOODWARD, an American lawyer and public official, born in Pittsburgh Pa., in 1858. He was educated under private tutors, at Lehigh University, and at the Law School of the University of Pennsylvania, from both of which institutions he later received honorary degrees. In 1880 he began the practice of law in Philadelphia, removing to New York in 1882. When he was appointed Attorney General of the United States in 1909, by President Taft, he resigned his membership in the law firm of Strong & Cadwalader, returning to the practice of law at the end of his term, in 1913. He was a member of the New York City and State Bar Associations, and of the American Bar Association, and a trustee of the Carnegie Institution of Washington. In 1915 he served as a delegate at large



GEORGE WOODWARD WICKERSHAM

and as the chairman of the Judiciary Committee of the New York State Constitutional Convention. During the World War he served as a member and as the vice-chairman of the district board of the city of New York under the Selective Service Law.

WIDDIN, a town and fortress of Bulgaria, on the right bank of the Danube; opposite Kalafat; 18½ miles from the Serbian frontier, and 130 miles E. S. E. of Belgrade. It is the seat of a Greek bishop, and has an important citadel. The difficulty of attacking the fortress is greatly increased by the flat, swampy character of the ground. It manufactures gold and silver filigree and saddles, and has considerable fishery, and trade in rock salt, corn, wine, and agricultural products. The merchants are principally Jews and Bulgarians. Widdin is the Bononia of the Romans. In 1801 it was the scene of the defeat of the Hospodar Michael Sutsos by Paswan Oglu, and here in October, 1853, Omer Pasha began the hostilities against Russia by crossing the Danube and occupying Kalafat, whereafter ensued several battles in the neighborhood between the Turks and Russians, the chief on April 6 and 19, 1854. In the war of 1877-1878 Widdin was occupied by 10,000 Turks. Osman Pasha was commandant, and it was from Widdin he made his unexpected march to Plevna—the scene of his early victories, and his heroic defense. By the Berlin treaty of July 13, 1878, it became part of Bulgaria. Pop. about 17,500.

WIDENER, PETER A. BROWN, an American capitalist; born in Philadelphia, Pa., Nov. 13, 1834; was early engaged in the meat business, in which he acquired a large fortune. Turning his attention to politics he was appointed to fill out the unexpired term of Joseph F. Mercer as city treasurer of Philadelphia in 1873, and in 1874 was elected for a full term. He became president of the West Philadelphia Passenger Railway Company, vice-president of the Union Passenger and the Philadelphia Traction Companies; a director of the Continental and Empire Passenger Companies; and in 1902 was head of a syndicate organized to acquire large street railroad interests in New York City. In 1897, he gave his city residence in Philadelphia, valued at $600,000, for a branch of the Free Lending Library; in 1898 presented a collection of 500 rare books valued at $28,000 to the library; and in 1899 undertook the erection and endowment of a combined home, hospital and industrial school, in Philadelphia, at a cost of $2,000,000. He died in 1915.

WIELAND, CHRISTOPH MARTIN, a German poet; born in Oberholzheim, Germany, Sept. 5, 1733; was educated at the University of Tübingen; appointed Professor of Philosophy in 1769 at Erfurt; and three years afterward went to Weimar as teacher to the sons of Duchess Anna Amalie. Here, or in the immediate neighborhood, he resided till his death, being a member of the circle to which Goethe, Schiller, and Herder belonged. The early period of his literary life was devoted to pietistic or at least serious poetry such as "The Nature of Things" (1752); "Twelve Moral Letters in Verse Anti-Ovid" (1752); "The Trial of Abraham's Faith" (1753); in the second period he produced the romances "Agathon" (1766); and "Don Sylvio de Rosalva" (1764); the poem "Musarion"

(1768); and a prose translation of Shakespeare (8 vols. 1762-1766); while in the third and ripest period were written the romantic epic of "Oberon" (1781); "History of the Abderites" (1784); "The Republic of Fools" (1786); "The Secret History of Peregrinus Proteus" (1791); etc. He also published translations of Horace, Lucian, and the "Letters of Cicero." He died in Weimar, Germany, Jan. 20, 1813.

WIELICZKA, a town in Poland; 9 miles S. E. of Cracow; famous for its wonderful salt mines, which have been continuously worked since 1250. They consist of seven different levels, or stories, one above the other, connected by intricate passages and flights of steps, and in some places by lofty bridges, measure from E. to W. 12,468 feet, from N. to S. 3,117 feet, and reach their greatest depth at 918 feet. The annual production of salt up to 1872 was 37,000 tons, but since that date it has gone up to 80,000 tons. Several of the disused galleries have been adorned with statues hewn in the rock salt, and two chapels have been excavated, in the larger of which the Mass is celebrated annually on July 3. The chapels were injured by the inundation of 1868. Pop. about 8,000.

WIERTZ, ANTON JOSEPH, a Belgian painter; born in Dinant, Belgium, Feb. 22, 1806; studied at Antwerp and Rome. In 1836 he settled in Liège, and in 1848 at Brussels. His original artistic ideal was to combine the excellencies of Michael Angelo and Rubens; and his efforts in this direction are visible in his pictures of "The Fight of Greeks and Trojans Round the Dead Body of Patroclus," "The Disobedient Angels," "The Death of St. Denis," "Eve and Satan," "The Flight Into Egypt," and "The Triumph of Christ"—some of them very large canvases. As he could not persuade himself to sell such pictures, he maintained himself now and later by painting portraits. About 1848-1850 he developed a new technical method which he called "Peinture Mate"; and now he began to paint totally different subjects—speculative and mystical pieces, dreams and visions, and the horrible outcome of a morbid imagination—premature burial, suicide, madness, execution, sensations after death. There were genre pictures also which were only eccentric — "Quasimodo," "The Young Witch;" and even pleasing and kindly pictures—"The Maid at Her Toilet," "The Confession"; and he also left some sculptures. In 1850 the state had built for him a large studio in Brussels, and at his death this became, by an arrangement between the state and his heirs, the Musée Wiertz, one of the sights of the city. He died in Brussels, June 18, 1865.

WIESBADEN, a town of Prussia, province of Hesse-Nassau; until 1866 capital of the independent duchy of Nassau; on the S. W. spurs of the Taunus Mountains, 377 feet above the sea; 6 miles N. of Mainz. It is well built, and contains a large number of splendid hotels. The chief buildings are the Gothic Protestant church (1853-1862), a noble edifice with five lofty towers, containing colossal marble statues of Christ and the four Evangelists; the Roman Catholic church (1844-1849), in the Romanesque style; the English church (1863-1865); the synagogue, in the Oriental style; the Schloss (1837-1840); the museum, with a picture gallery, a collection of antiquities, a natural history collection, and a library of 100,000 volumes; the Pauline palace (1842), in Moorish style; the government buildings (1842), in the Florentine palatial style; the Greek chapel, erected by the Duke of Nassau as a mausoleum for his first wife, Elizabeth Michailowna; and the Kursaal, the principal resort of visitors, the largest hall of which is 132 feet long, 60 feet wide, and 48 feet high. Connected with the Kursaal by a long iron Trinkhalle is the Kochbrunnen, the principal of the 22 medicinal springs of Wiesbaden. Its waters have a temperature of 156° F. The second spring is that in the garden of the Adler Hotel, 147° F. Wiesbaden is one of the most frequented spas in Europe. The springs of Wiesbaden are spoken of by Pliny as the "Fontes Mattiaci," and on the Heidenberg, N. of the town, traces of a Roman fortress were discovered in 1838, which seems to have been connected with the town by a wall, the Heidenmauer ("heathens' wall"), in the ruins of which votive tablets and inscriptions have been discovered. Pop. about 110,000.

WIGAN, a municipal and parliamentary borough, Lancashire, England, on the Douglas, 21 miles N. E. of Liverpool. Wigan stands in the center of an extensive coal field, and its manufactures, which are important, consist chiefly of calicoes, fustians, and other cotton goods, linens, checks, cotton twist, etc., besides iron foundries, iron forges, railway car works, iron rolling mills, large breweries, chemical works, and corn and paper mills. Pop. about 90,000.

WIGGIN, KATE DOUGLAS, an American author; born (Smith) in Philadelphia, Pa., Sept. 28, 1857. Her youth was spent in Hollis, Me., and she attended Abbott Academy in Andover, Mass. She went to California in 1876, where

she studied the kindergarten system in Los Angeles; later, she taught a year in Santa Barbara College; then went to San Francisco, where she organized the first free kindergarten in the West. In 1880 she organized the California Kindergarten Training School, with her sister Nora A. Smith, and Mrs. S. B. Cooper. In 1880 she married S. B. Wiggin, a lawyer, and they moved to New York, where Mr. Wiggin died in 1889. In 1895 Mrs. Wiggin married George C. Riggs. She wrote many stories and books on and for the kindergarten, among them being "The Story of Patsy," "The Birds' Christmas Carol," "Polly Oliver's Problem," "The Story Hour," and "Kindergarten Principles and Practice." Her novels, which attained wide popularity, include "Penelope's Progress," and "Rebecca of Sunnybrook Farm." She received the degree of Litt. D. from Bowdoin College.

WIGHT, ISLE OF, an island off the S. coast of England; in the county of Hants; separated from the mainland by Spithead and the Solent; 23 miles in length, 13 miles broad; area, 93,341 acres. The main slope of the island is to the N., as is shown by the course of its chief streams, the Medina, Yar, and Eastern Yar. A range of chalk downs, which cross the island from E. to W. and form excellent sheep walks, separate it into two districts somewhat different in character. The general appearance is picturesque, and the geology of the island is interesting. The air is remarkably mild, and the district known as the Undercliff, lying along the S. coast, and completely sheltered from the N., has long been a resort for invalids. The Isle of Wight is represented in Parliament by one member. The chief towns are Newport (the capital), Ryde, Cowes, Ventnor, Bembridge, Freshwater, Yarmouth, and the fashionable health resorts of Sandown and Shanklin. Near Cowes is Osborne House, which was a favorite residence of Queen Victoria. Carisbrooke Castle is an interesting ruin. Pop. about 85,000.

WILBERFORCE, WILLIAM, an English philanthropist; born in Hull, England, Aug. 24, 1759. After completing his education at St. John's College, Cambridge, he was, in 1780, elected to Parliament for his native town; and in 1784 he was returned by the county of York. In 1786 he made the acquaintance of Clarkson, who gained his sympathies on behalf of the agitation against the slave trade. In 1791 he moved for leave to bring in a bill to prevent further importation of African negroes into the British colonies. Year after year he pressed this measure, but was always defeated till 1807, when it was passed during the short administration of Fox. He then devoted his energies to bring about the total abolition of slavery, and three days before his death he was informed that the House of Commons had passed a bill which extinguished slavery in the British colonies. He died in Cadogan Place, London, July 29, 1833.

WILBERFORCE UNIVERSITY, a coeducational institution in Wilberforce, O.; for colored students; founded in 1856 under the auspices of the Methodist Episcopal Church; reported at the close of 1919: Professors and instructors, 42; students, 600; president, W. S. Scarborough, LL. D.

WILBROD, or **WILLIBROD, ST.**, born in the Saxon kingdom of Northumbria, about 657; generally called "The Apostle of the Friesians." He was a monk of Wilfred's monastery, at Ripon, and about 677 went to Ireland to preach Christianity. In 690 he went to Utrecht, and having, after great exertions, converted large numbers of the Friesians to Christianity, he was rewarded with the bishopric of Utrecht by Pope Sergius I. He also preached to the Danes, and established the monastery of Echternach, near Treves. He died in 738. He is commemorated in the Roman Catholic Church on Nov. 7.

WILBURITES, a section of American Quakers, named from their leader, John Wilbur, who separated from the main body in the first half of the 19th century on the ground that the Quakers were abandoning their original principles.

WILCOX, ELLA WHEELER, an American journalist and poet; born in Johnstown Center, Wis., Nov. 5, 1855. She contributed much to current periodicals and to newspapers and her poems were widely copied. Some of her volumes are: "Maurine" (1882); "Poems of Passion" (1883); and "Poems of Pleasure" (1888); "Drops of Water"; "Sweet Danger"; etc. She also published a novel, "Mal Moulée" (1885); and numerous other books. She died Oct. 30, 1919.

WILDE, OSCAR (FINGAL O'FLAHERTIE WILLS), an Irish poet; born in Dublin, Ireland, in 1856. Some of his works are: "Poems" (1880); "The Picture of Dorian Gray," a novel; "The Happy Prince, and Other Tales" (1888); "Guido Ferranti" (1890), and "The Duchess of Padua," tragedies; "Intentions," essays (1891); "Lord Arthur Savile's Crimes, and Other Stories" (1891); "Lady Windermere's Fan," "A

Woman of No Importance," and "The Importance of Being Earnest," and other comedies. He died in Paris, Nov. 30, 1900.

WILDER, BURT GREEN, an American educator and author, born at Boston, Mass., in 1841. He graduated from the Lawrence Scientific School at Harvard in 1862, and from the Medical School in 1866. From 1862 to 1865 he was a medical cadet of the 55th Massachusetts Infantry. He was an assistant in comparative anatomy at the Museum of Comparative Zoölogy from 1866 to 1868, and from 1867 to 1910, was professor of neurology and vertebrate zoölogy at Cornell University. He was appointed emeritus professor in 1910. He made many important researches in the anatomy of the brain, and was the author of "What Young People Should Know" (1875); "Health Notes for Students" (1890); "The Brain of the Sheep" (1903). He also wrote several songs and hymns, and contributed numerous scientific papers to magazines and books of reference.

WILDER, MARSHALL PINCKNEY, an American humorist; born in Geneva, N. Y., Sept. 19, 1859; received a fair education, and became a stenographer. He soon, however, developed a remarkable ability as a humorist, which was rendered all the more attractive by his diminutive stature; and for several years he was a popular entertainer, especially in private drawing-room gatherings both in the United States and England. He was the author of "People I've Smiled With." He died in 1915.

WILDERNESS, a loation in Spottsylvania co., Va., 16 miles W. of Fredericksburg. During the Civil War a sanguinary battle was fought here, May 5 and 6, 1864, between the Nationals under General Grant, and the Confederates, commanded by General Lee, which, after a terrific struggle, and unprecedented slaughter, particularly on the side of the Nationals, resulted in both sides claiming the victory, General Lee, nevertheless, gradually retiring on Spottsylvania. The National loss amounted to 18,000 men; that of the Confederates to about 11,000.

WILEY, HARVEY WASHINGTON, an American chemist and food expert, born at Kent, Ind., in 1844. He graduated from Hanover College in 1867; and studied medicine at the Indiana Medical College. He taught science in the High School of Indianapolis in 1871, and in 1874 was professor of chemistry at Butler University. From 1874 to 1883 he was professor of chemistry at Purdue University, and State chemist of Indiana. From 1883 to 1912, he was chief of the Division of Chemistry in the United States Department of Agriculture. By his rigid enforcement of pure food and drug laws, he aroused the antagonism of manufacturers of patent foods and drugs, and they brought charges against him. An investigation by Congress followed and he was completely exonerated. At the time of his employment by the Department of Agriculture, he was also professor of agriculture and chemistry at George Washington University. He resigned from the Department of Agriculture to devote himself to pure food propoganda by public lectures, and as the editor of the magazine, "Good Housekeeping." He was president of the American Chemical Society in 1893, and also served as president and official in many other scientific and learned societies. He wrote many works relating to the chemistry of food. These include "Foods and Their Adulterations" (1911); "Not by Bread Alone" (1915); "Beverages and Their Adulterations" (1919); "Health Readers for Schools" (1919). He also wrote many Government bulletins on subjects relating to food.

WILFRID, ST., Bishop of York; born in Northumbria in 634. He was brought up in the monastery of Lindisfarne, but at 18 visited Rome, returning in 658 a warm partisan of the Roman party in the controversy with the native Church on the shape of the tonsure and the time of keeping Easter. At the synod of Whitby (664) he contended against Bishop Colman, and succeeded in gaining over the king, who learning it was only St. Peter to whom the keys had been given, thought it most prudent to be on his side lest Peter should pay him out in his need by closing the gate on him. Already he had been given the monastery at Ripon, and now he was chosen Bishop of York, being consecrated at Compiègne. On his return he found that Chad had been elected Bishop of Northumbria; but Archishop Theodore restored Wilfrid. He improved the minster of York, built a splendid church at Hexham, some of the underground portions of which still remain, and raised a new minster at Ripon, the vault of which, called St. Wilfrid's Needle, still exists. Theodore, without consulting Wilfrid, divided Northumbria into the sees of Lindisfarne, Hexham, and Whitherne, in addition to York, and Wilfrid made his appeal to Rome. On the journey he was driven by a storm to the coast of Fries-

land, the inhabitants of which were still pagan. Such was the effect of his preaching that thousands were baptized, and that work of conversion begun which was to be completed by Boniface and Willibrod. Pope Agatho decided in his favor, but King Ecgfrid flung him into prison. He escaped to Sussex, was allowed to return by the new King Aldfrid in 686, keeping the sees of York and Ripon. But again he appealed to Rome against the measures of the new primate, Berthwald (704), and was finally, after a council held near Ripon, allowed to keep Ripon and Hexham, but not York. He died in Oundle, in Northamptonshire, in 709, and was buried in Ripon.

WILHELMINA I., Queen of the Netherlands; born in The Hague, Aug. 31, 1880; was the daughter of King William III., of the Netherlands, by his second wife, the Princess Emma Adelaide Wilhelmina Theresa. Her mother was a sister of the Duchess of Albany, being daughter of Prince George Victor of Waldeck-Pyrmont. Queen Wilhelmina succeeded to the throne on the decease of her father, in November, 1890, but her mother acted as Queen-Regent till the young queen came of age, Aug. 31, 1898, and amid the enthusiasm of her people, was installed as sovereign. On Feb. 7, 1901, she married Duke Henry of Mecklenburg-Schwerin. A daughter Juliana, was born in April 30, 1909.

WILHELMSHAVEN, the chief naval port of Germany; on the W. side of the entrance of the Bay or Gulf of Jahde; 45 miles N. W. of Bremen. The town, first projected in 1856, has been regularly laid out on a strip of ground bought by Prussia from Oldenburg in 1864, and was inaugurated by King William in June, 1869. It was until 1919 a fortress of the first rank, defended by outlying forts and an elaborate system of torpedoes, and, with its moles, extensive basins, dry docks, vast stores for the navy, and workshops for all the requirements of a fleet, had been a very costly creation—the massive buildings being erected on soft and swampy ground, without any natural advantage save its situation. Water has been obtained by means of artesian wells. A harbor for commercial purposes has been made to the S. of and connected with the naval one. During the World War it was one of the chief German naval stations, and was a main depot for the submarine fleet. Pop. about 35,000.

WILKES, JOHN, an English political agitator; born in London, England, Oct. 17, 1727; was educated for some time at Leyden; was elected to Parliament as member for Aylesbury (1757), and attained considerable notoriety by the publication of a paper entitled the "North Briton," in No. 45 of which (1763) he commented severely on the king's speech to Parliament. The home secretary in consequence issued a general warrant, on which Wilkes, with others, was apprehended and committed to the Tower, but released by Chief-Justice Pratt, who declared the prosecution illegal. On the next meeting of Parliament, however, a special law was passed to sanction his prosecution, and in 1764 he was expelled from the House of Commons. As he had by this time withdrawn to France and did not appear to receive sentence, he was outlawed. He returned, however, to England at the election of 1768, and was sent to Parliament as representative of Middlesex, but was expelled from the House and committed to prison. Three times after this he was re-elected within a few months by the same constituency, but the House of Commons persisted in keeping him out, giving rise to a formidable agitation in favor of "Wilkes and liberty." He was released from prison in 1770, having been elected alderman of London, and he was next appointed sheriff of Middlesex, lord-mayor of London, and again (1774) member of Parliament for Middlesex. On this occasion he was allowed to take his seat, and in 1782 the resolutions respecting the disputed Middlesex election were expunged from the journals of the House of Commons. He published many speeches and pamphlets, and two collections of his correspondence were published after his death, in London, Dec. 27, 1797.

WILKES-BARRE, a city of Pennsylvania, the county-seat of Luzerne co. It is on the Susquehanna river, and on the Lehigh Valley, the Pennsylvania, the Lackawanna and Wyoming Valley, the Delaware and Hudson, and the Central of New Jersey railroads. Wilkes-Barre is the center of the largest anthracite coal center in the world. It has, in addition, other important industries, including the largest axle and spring factory in the world; one of the largest wire and rope mills; and large locomotive and steel works. There are also 22 silk mills, a large lace mill, and manufactories of hosiery, shirts, mattresses, etc. There are 25 miles of paved streets and 52 miles of sewers. The parks have an area of over 300 acres, and there are over 200 churches of all denominations. The hospitals include four free hospitals, one private, and one contagious disease hospital. The city has excellent educational advantages. There are 25 public schools, 2 parochial schools, 3 business schools,

and 3 private schools, with a total enrollment of over 15,000. There are extension schools of the University of Pennsylvania and of Pennsylvania State College. In the city are 26 banks and trust companies, and total combined savings deposits of $66,973,400 in 1919. The total clearings in that year were $133,507,744. There are many wholesale establishments, dealing in over 125 classes of articles. The assessed valuation of the city in 1919 was $79,000,000. The valuation of the products of the manufacturing industries in the same year was $75,000,000. The city was founded in 1769 and incorporated in 1806. It became a city in 1871. Coal has been mined in the vicinity since the Revolutionary period. Pop. (1910) 67,105; (1920) 73,833.

WILKIE, SIR DAVID, a Scotch painter; born in Cults, Scotland, Nov. 18, 1785; received his early training at the Trustee's Academy, Edinburgh; entered the schools of the Royal Academy, London, in 1805; first exhibited there (1806) "The Village Politicians," which at once established his reputation; was elected an associate of the Academy in 1809, and in 1811 became an academician. In 1825, owing to ill health, he made an extended tour through Italy, Germany, and Spain. In the latter country his style as a painter underwent a marked change when he came under the influence of Velasquez and Murillo. Returning after three years to England, he was appointed (1830) painter in ordinary to the king, and was knighted in 1836. His pictures, such as the "Blind Fiddler," "Rent Day," "Cut Finger," "Rabbit on the Wall," "Penny Wedding," "Cottars' Saturday Night," "Duncan Gray," "Blind Man's Buff," "Chelsea Pensioners Reading the Gazette of Waterloo," "John Knox Preaching Before the Lords of the Congregation," etc., are well known as engravings. These belong for the most part to his early and best period, when his method was characterized by subdued coloring and minute and spirited drawing. His later and less successful style is distinguishable by a breadth of treatment which sometimes shows looseness in drawing, and deals chiefly with historical subjects. It is represented by "The Entrance of George IV. Into Holyrood," "The Spanish Council of War," "The Maid of Saragossa," "Napoleon and Pius VII.," and "The Queen's First Council." He died at sea off Gibraltar, June 1, 1841, while returning from a visit to Palestine.

WILKINSBURG, a borough of Pennsylvania, in Allegheny co. It is a residential suburb of Pittsburgh. It has two homes for the aged. Pop. (1910) 18,924; (1920) 24,403.

WILKINS-FREEMAN, MARY ELEANOR, an American author; born in Randolph, Mass., in 1862. Her works, studies of New England country life, are: "The Adventures of Ann" (1866); "A Humble Romance" (1887), "A New England Nun" (1891), and "Young Lucretia" (1892), collections of short stories; "Giles Corey, Yeoman" (1893), a play; "Jane Field" (1893), "Pembroke (1894), novels; "The Long Arm" (1895), a $2,000 prize detective story; "Jerome"; "Silence"; "The Love of Parson Lord"; "Understudies"; etc. She was married to Dr. Charles M. Freeman, Jan. 1, 1902.

WILKINSON, WILLIAM CLEAVER, an American educator; born in Westford, Vt., Oct. 19, 1833; was graduated at the University of Rochester in 1857; and in 1873 became dean of the Department of Literature and Art in the Chautauqua University, for which he prepared many text-books. In 1892 he became Professor of Poetry at Chicago University. Among his works are: "The Dance of Modern Society" (1869); "A Free Lance," etc. (1874); "The Baptist Principle" (1881); "Webster: An Ode" (1882); "Poems" (1883); essay on "Edwin Arnold" (1884); "College Greek Course in English"; "The Epic of Paul"; "The Epic of Saul"; "Poems"; "Paul and the Revolt Against Him" (1914); etc. He died in 1920.

WILL, in law, the declaration, in proper form, of what a man wills to be performed after his death; usually spoken of as the "last will and testament."

The statutes of most of the American States have either placed nuncupative wills under special restrictions, or else reduced them within the same narrow limits as the English statutes. In many of the States they still exist much as they did in England before the above-quoted statute, being limited to a small amount of personal estate. Leaving aside this unimportant exception, it may be said that all wills, whether of real or personal estate, must be in writing, and signed at the foot or end thereof by the testator, or by some person in his presence, and by his direction, in the presence of two witnesses at least, who must subscribe and attest the will in his presence. The signature must be so placed at, after, following, under, or beside or opposite the end of the will, that it shall be apparent on the face of the will that the testator intended to give

effect by such his signature to the writing signed as his will. In general, all persons who have sufficient understanding are capable of disposing by will of both real and personal estate. The age at which persons may make wills varies from 21 to 14; sometimes only personal property may be bequeathed by persons of 18 or under. There are certain restrictions, varying in different States, upon a married woman's testamentary capacity. Lunatics, idiots, persons under undue influence, or under duress, are incapable to execute a will.

A will is a revocable instrument, and is revoked by marriage either in the case of a man or woman, but it is not revoked by any other change of circumstances. It may, however, be revoked by another will or codicil subsequently executed, or by a writing declaring the intention to revoke, or by burning, tearing, or otherwise destroying the will with the intention to revoke it. A revoked will may be revived by re-execution, or by a codicil showing an intention to revive it. No obliteration, interlineation, or any other alteration in a will, is valid, except so far as the words or effect of the will before the alteration shall not be apparent unless with such alteration. But if the signature of the testator and subscribing witnesses be made in the margin opposite or near the alteration, or at the foot or end, referring to the alteration, it will be valid. A will takes effect as if executed immediately before the testator's death, unless the contrary intention be shown by the will; and lapsed and void devices fall into the residue of the estate.

WILL, a mental phenomenon of which there are recognized three orders or classes: Cognition, feeling, and will. The first includes all the ways in which facts and relations become known; the second refers to the way in which the mind is affected as regards pleasure and pain; to the third, or will, belong all those mental states in which the mind or subject is regarded as producing changes either in the state of mind itself or in its bodily environment. The movements thus produced are called voluntary, and the mental acts producing them volitions. The term will may thus be said to refer to the active side of mind.

WILLAMETTE RIVER, a river in Oregon, rises in Lane county, and flows into Columbia river, 8 miles below Fort Vancouver, after a N. N. W. course of 200 miles, of which it is navigable for large vessels 15 miles to Portland, and above the falls for small steamboats about 60 miles. The valley of the Willamette is very fertile and picturesque, and often styled the "Garden of Oregon."

WILLAMETTE UNIVERSITY, a co-educational institution in Salem, Ore.; founded in 1844, under the auspices of the Methodist Episcopal Church; reported at the close of 1919: Professors and instructors, 15; students, 318; president, Rev. C. G. Doney, Ph. D.

WILLARD, DANIEL, an American railway official, born at North Hartland, Vt., in 1861. He was educated at the Windsor (Vt.) High School and at the Massachusetts Agricultural College. In 1879 he entered the railway service, occupying various offices with different railway companies until 1899. From 1899 to 1901 he was assistant general manager of the B. & O. railroad; from 1901 to 1904, assistant to the president; and later 3d and 1st vice-president and general manager of the Erie railroad; from 1904 to 1910, 2d vice-president of the C. B. & Q. railroad; and since 1910, president of the B. & O. railroad. In 1914 he became a member of the board of trustees of Johns Hopkins University. During the World War he served as a member and later as the chairman of the Advisory Commission of the Council of National Defense, becoming, in November 1917, chairman of the War Industries Board, which office he resigned in 1918.

WILLARD, EMMA (HART), an American educator; born in Berlin, Conn., Feb. 23, 1787. She did much for bettering the education of women. Her books, educational and general, include: "A Plan for Improving Female Education" (1819); "A History of the United States" (1828); "Poems" (1830); containing the popular song "Rocked in the Cradle of the Deep"; "Journal and Letters from France and Great Britain" (1833); "Universal History" (1835); "Respiration and Its Effects"; and "Morals for the Young" (1857). She died in Troy, N. Y., April 15, 1870.

WILLARD, FRANCES ELIZABETH, an American temperance reformer; born in Churchville, near Rochester, N. Y., Sept. 28, 1839. Her early education was received at Oberlin College, and her parents removing to Illinois she was graduated at the Northwestern Female College at Evanston, Ill., in 1859. After some years spent in teaching she became Professor of Esthetics in the Northwestern University, and was made dean of the Women's College in February, 1871. She began her active temperance work in 1874, and was made secretary of the National Woman's Christian Temperance Union. In 1879 she was made president of that organization and held the office till her death. She was chosen

as president of the World's Woman's Christian Temperance Union in 1888, and in 1892 visited England as the guest of Lady Henry Somerset, the well-known temperance worker. During her visit in London she addressed a mass meeting at Exeter Hall which was said to be the largest and most intensely interesting assemblage ever held in its walls. She was an untiring worker and for 10 years averaged one public meeting a day, besides writing letters and articles, and planning work while in transit between towns at which she spoke. She was editor-in-chief of the "Union Signal" from 1892, and a frequent contributor to other periodicals and newspapers, being an admirable writer and a journalist of rare tact, quickness and force. She was an orator of great eloquence, humor, and power. Her executive ability and genius for organization were wonderful and her work for temperance and social purity will live in the history of her country. She died in New York City, Feb. 18, 1898.

WILLET'S POINT, an American military reservation on Long Island Sound; 20 miles N. E. of the Battery, New York City, and opposite Fort Schuyler. It contains 136 acres which were purchased by the Government in 1857 and 1863.

WILLIAM I., the CONQUERER, King of England, the natural son of Robert, Duke of Normandy; born in Falaise, in 1027. He was brought up at the court of the King of France, and succeeded to the duchy at the age of eight. But during his minority there were frequent revolts of the nobles, and his authority was not fully established for many years. On the death of Edward the Confessor, King of England, William made a formal claim to the crown, alleging a bequest in his favor by Edward, and a promise which he had extorted from Harold. His claim being denied, he at once prepared for an invasion of England; effected a landing at Pevencey, Sept. 28, 1066, while Harold was engaged in opposing the Norwegians in the N., and fortified a camp near Hastings. The decisive battle of Hastings was fought on Saturday, Oct. 14, 1066; Harold was defeated and slain, and the Norman Conquest was commenced. His rival, Edgar Atheling, was supported by some of the leading men for a short time; but they all made submission to William at Berkhamstead, and on the following Christmas day he was crowned at Westminster by Aldred, Archbishop of York. He reigned with great tyranny; in consequence of which several insurrections took place, and were not quelled till the conqueror had depopulated different districts by fire and sword. He then divided the lands of most of the nobility and gentry among his followers. He also introduced the language of the north of France (called in England the Norman language), and ordered that all law pleadings and statutes should be in that tongue. To prevent nightly meetings and conspiracies, he instituted the curfew, or "cover-fire bell," at the sound of which every night, at eight o'clock, all fires and candles were to be put out. A survey was made of all the lands in the kingdom, the account or register of which



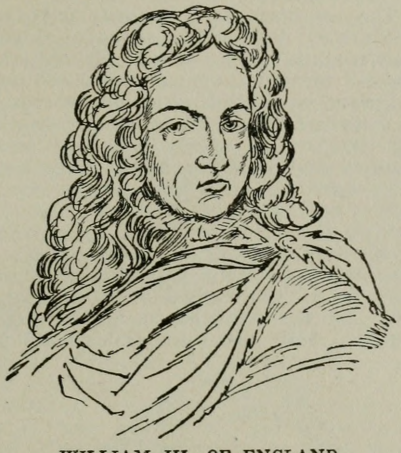
WILLIAM I. THE CONQUEROR

was called the "Domesday Book." In 1078 he finished the Tower of London; in 1087 he attacked and destroyed the city of Mantes. He was about to march toward Paris, but died in Rouen, Sept. 9, 1087.

WILLIAM II., usually called RUFUS; born in Normandy in 1056, the son of the Conqueror, and crowned on the news of his father's death reaching England, in 1087. He made a conquest of a part of Wales, and obtained the duchy of Normandy from his brother Robert, in 1095. He was a great persecutor of the clergy, and banished Lanfranc, Archbishop of Canterbury, from the kingdom. William was, according to the monkish chronicles, accidentally slain by an arrow, shot by Sir Walter Tyrrel, as he was hunting in the New Forest, Hampshire, Aug. 2, 1100.

WILLIAM III., of NASSAU, PRINCE OF ORANGE and King of England; born in The Hague, Holland, Nov. 4, 1650; was the son of William, Prince of

Orange, and Mary, daughter of Charles I. He married the Princess Mary, daughter of James II., then Duke of York, and became stadtholder of Holland in 1672. He was also nominated general of the troops of Holland against Louis XIV., and made a vigorous resistance to

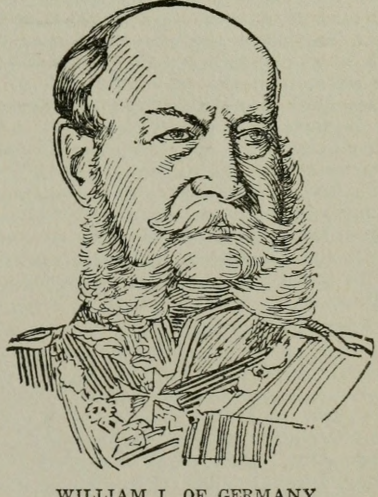


WILLIAM III. OF ENGLAND

the French armies under Luxembourg, whom he defeated in 1674; but was repulsed in his turn by the Prince de Condé. In 1688 the arbitrary measures, both against the established religion and the constitution, of James II., induced many nobles and others to invite the Prince of Orange to take possession of the English crown. He embraced the occasion, and landed without opposition at Torbay, the same year. James, finding himself unsupported, withdrew to France, and William took possession of his throne, in conjunction with his wife, the daughter of that unfortunate monarch. His coronation as King of England took place in 1689. The year following William went to Ireland, where he defeated James at the battle of the Boyne. In 1691 he headed the confederate army in the Netherlands, took Namur in 1692, and in 1697 was acknowledged King of England by the treaty of Ryswick. On the death of Mary in 1694, the Parliament confirmed to him the royal title. His death was owing to a fall from his horse, by which he broke his collar bone, March 8, 1702.

WILLIAM IV., King of England; born in London, Aug. 21, 1765; the third son of George III. In his 15th year he entered the royal navy, and in 1780 was with Admiral Rodney when the latter defeated a Spanish squadron off Cadiz, and afterward proceeded to the relief of Gibraltar. Prince William subsequently held the command of a vessel of war in various parts of the world, but retired from active service in 1790. On the death of his brother, George IV., in 1830, he became King of England, and ruled till 1837. At his death, the Princess Victoria, daughter of his brother, the Duke of Kent, became Queen of England. He died in Windsor, June 20, 1837.

WILLIAM I., Emperor of Germany, and King of Prussia, son of Frederick William III., by Princess Louise of Mecklenburg-Strelitz, and brother of Frederick William IV.; born in Berlin, March 22, 1797, received a military education, and took part in the campaigns of 1813 and 1815 against France. In 1840 he was appointed governor of Pomerania, which post he held till the revolution of 1848, when he sought refuge in England. He was elected a member of the Constituent Assembly in May of the same year, when he returned to Berlin. In 1849, as Commander-in-Chief of the Prussian army, he acted against the revolutionary Badeners; and in 1858, on the lunacy of his brother, the king, becoming manifested, Prince William was appointed regent. This position he occupied till Frederick William's death, in 1861, when he succeeded to the throne, crowning himself with his own hands, at Königsberg, on which occasion he emphatically asserted the doctrine of the "divine right



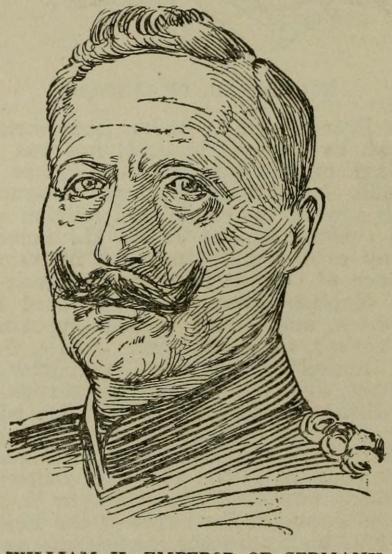
WILLIAM I. OF GERMANY

of kings." Actuated by this spirit, and selecting as his ministers men of well-known reactionary principles, of whom the chief was Count Bismarck, William speedily embroiled himself and government with the liberal parliamentary

body of that day; and this to so critical a degree, after the accession of Bismarck to the premiership in 1862, that the rupture threatened to end in revolution or civil war. A diversion from this state of things was, however, happily effected by the war which Prussia, conjointly with Austria, declared against Denmark. In 1866, war was next declared by Prussia against her old ally, Austria; and after a short campaign, in which the king and the royal princes took part, Austria was compelled to make a humiliating peace. The terrible effect of the needle gun created quite a panic in the Austrian army, and her generals found it would be useless to prolong the struggle. By this war Prussia obtained supremacy in Germany. In July, 1870, the Emperor Napoleon III., taking umbrage at Prussian interference with the succession to the vacant Spanish throne, or prompted by other motives, rashly declared war against Prussia, a power long prepared for such a contingency. On this, William, forming an alliance with the south German states, and constituting himself Commander-in-Chief of the united German armies, crossed the Rhine, and in a short but brilliant campaign, defeated the French in a series of battles, took Napoleon and his principal commanders prisoners, and received the capitulation of Paris, in February, 1871. Peace was finally declared by a treaty entered into at Versailles, by which Prussia acquired the province of Alsace, part of that of Lorraine, including the city of Metz, along with a war indemnity of $1,000,000,000. His success in the war with France led to an offer from the German states of the imperial crown of Germany, which he accepted. He was crowned Emperor of Germany at Versailles, Jan. 18, 1871. His 90th birthday was celebrated throughout Germany, March 22, 1887, and he died March 9, 1888. He was succeeded by his son Frederick, who was succeeded in the same year by his son William, as William II.

WILLIAM II., Emperor of Germany and King of Prussia; eldest son of Frederick III. and Victoria, princess royal of England; born Jan. 27, 1859; educated at Cassel and Bonn, married Augusta Victoria of Schleswig-Holstein-Augustenburg in 1881, and succeeded his father, June 15, 1888. After his accession he took an active interest in social questions, and the strong initiative which he adopted in political affairs brought about the retirement of Prince Bismarck in 1890. He sent a congratulatory telegram to President Kruger when Dr. Jameson's force was defeated in December, 1895. In 1898 he paid a visit with the empress to Constantinople, where they remained some time as the Sultan's guests, afterward going to Palestine and Jerusalem. In 1902 he sent his brother Henry, Prince of Prussia, on a social visit to the United States, as his representative on the launching of his new yacht.

The outstanding characteristics of William II. were aggressiveness, impulsiveness, and a more or less contradictory leaning toward the past, combined with a limited appreciation of many aspects of modern life. In his internal policy, he devoted himself specially to the maintenance and building up of Germany's army and navy, the development of education, and industry. While at first continuing the state socialism inaugurated by Bismarck, he began bitterly to oppose the Socialist party and its aims, and then as a result of Germany's change from an agricultural to an industrial country, both the membership and the



WILLIAM II. EMPEROR OF GERMANY

influence of the Socialists rapidly increased. In his foreign policy he maintained the Triple Alliance. Toward the latter part of his reign he frequently showed a keen jealousy of England and of her powerful influence over world politics. Although in many of his public utterances, and indeed, in many of his public acts, he appeared as a believer in world peace, there can be no doubt that in the years immediately preceding the outbreak of the World War, he gradually changed his attitude to a more aggressive one. The exact extent to which he was personally responsible for the outbreak

of the World War, and how far it lay in his power in the summer of 1914 to prevent war, cannot be determined until all the facts are known.

After the outbreak of the World War, the Emperor devoted himself more or less exclusively to military affairs, spending most of his time near the various fronts, although, of course, not actively participating in any of the fighting. When it became clear, in the fall of 1918, that the German armies on the western front were facing inevitable defeat, and when, at the same time, a series of revolutions in various parts of Germany made it evident that the Imperial Government was about to collapse, the Emperor finally, on Nov. 8, 1918, abdicated. The abdication was announced the following day, although the actual official act was not written and signed until the end of November 1918. It was dated Amerongen, Holland, Nov. 28, 1918. It was at this place that the Emperor had sought refuge at the castle of Count Bentinck, a Dutch nobleman. Eventually the Dutch Government permitted him to remain after certain guarantees had been received from the Emperor. In 1920 the Emperor purchased an estate of his own a short distance of Amerongen, at Doorn, where he continued to live in exile. His wife, ex-Empress Augusta Victoria, died on April 10, 1921.

WILLIAM I., FREDERICK, King of Holland, Grank-Duke of Luxembourg, Prince of Orange and Duke of Nassau; born in The Hague, Aug. 24, 1772. He distinguished himself in the wars with the French republic, and became an exile with his father, the hereditary stadtholder of the Dutch republic, in 1795; after his father's death, he succeeded first to the duchy of Nassau, and joined the Prussian army against Napoleon. He became King of Holland by the settlement of affairs which followed the fall of Napoleon in 1814, the countries united under his rule by the Congress of Vienna being the old united provinces of Holland, the bishopric of Liège, and Belgium; the latter, however, was separated by the revolution of 1830. He abdicated in 1840, and died in Berlin, Dec. 12, 1843.

WILLIAM II., FREDERICK GEORGE LEWIS, son and successor of the preceding; born in The Hague, Dec. 2, 1792, distinguished himself in the peninsular war under Lord Wellington; he also commanded the army of the Netherlands at the battle of Waterloo. His reign commenced immediately upon his father's abdication in 1840. He died March 17, 1849.

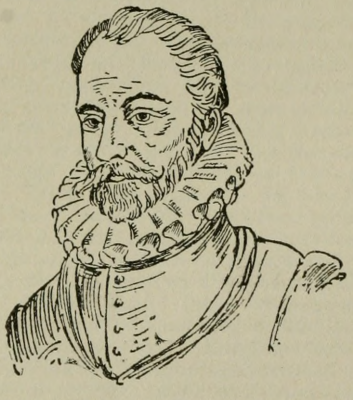
WILLIAM III., ALEXANDER PAUL FREDERICK, son and successor of the preceding; born in The Hague, Feb. 19, 1817. His reign was chiefly distinguished by undertakings of internal improvement; and, under his rule, the kingdom enjoyed uninterrupted peace, and material prosperity increased. While Prince of Orange, William married, 1839, the Princess Sophia Frederica Matilda, daughter of the late King William I., of Württemberg. They had two sons; William Nicholas Alexander Frederick Charles Henry, Prince of Orange; born in 1840, and William Alexander Charles Henry Frederick; born in 1851, and died in 1884, the last male heir of the house of Orange. William III. died at the Castle of Loo, Nov. 23, 1890.

WILLIAM I., surnamed THE LION, King of Scotland; born in 1143, a grandson of David I., and brother of Malcolm IV., whom he succeeded in 1165. Whence he derived his designation is one of the mysteries of history. His predecessors had long contested with the Kings of England the sovereignty of Northumberland and other districts of what is now the N. of England. Under Malcolm these claims were virtually abandoned and the king of Scots received, as a sort of equivalent for them the earldom of Huntingdon and other valuable estates. William had still, however, a hankering after the Northumbrian districts. He attended Henry of England in his continental wars, and is supposed, when doing so, to have pressed for a portion at least of the old disputed districts. In his disappointment he invaded them after the example of his ancestors. On July 13, 1174, he fell, near Alnwick Castle, into the hands of an English party. For security he was conveyed to Normandy, and there he consented, as the price of his liberation, to perform that homage for his kingdom which the English kings so long in vain attempted to exact from the government of Scotland. The treaty of Falaise, as the transaction was termed, from the place where it was adjusted, was revoked in the year 1189 by Richard I. of England in consideration of a payment of 10,000 marks, which he wanted for his celebrated expedition to Palestine. William had several disputes with the Church, but he was one of the early benefactors of the regular ecclesiastics and founded in 1178 the great abbey of Arbroath, which he dedicated to Thomas Becket, slain eight years earlier. William died in Stirling in 1214.

WILLIAM I., OF NASSAU, Prince of Orange, surnamed THE SILENT; the first

leader in the Dutch war of independence; born in Dillenburg, Nassau, April 14, 1553, of Lutheran parents, but descended from the ancient counts of that principality. Being trained to political employments at the court of Charles V., he conformed outwardly to Catholicism, and had become governor of the provinces of Holland, Zealand and Utrecht while the reformed doctrines were spreading, and events were ripening for the revolt of the Netherlands.

Philip II., King of Spain, having appointed Margaret of Parma, a natural daughter of his father, Charles V., stadtholdress, with the Cardinal of Granville for her adviser, the latter began his career by persecuting the Protestants, and was preparing to introduce the inquisition, when, in 1566, the nobles went in procession, and petitioned Margaret against this measure; and as



WILLIAM I. OF NASSAU, PRINCE OF ORANGE

they were treated with contempt, their remonstrances were followed by popular commotions. On this, Alva was sent, at whose approach 100,000 of the most industrious Flemings took refuge in foreign countries. This was the crisis at which William came forward, and raised the standard of independence. Though the cruel Alva was recalled at the end of six years, 1574, and replaced by a milder ruler, the Dutch continued the war, and Holland was liberated by the relief of Leyden, which William effected by laying the whole country under water in 1575. He was now elected stadtholder, and Calvinism became the established religion, to the exclusion of Lutheranism as well as the Roman Catholic faith. By the "Pacification of Ghent" in 1576, William united all the provinces in one confederation, but he found it impossible to heal these internal causes of disunion, and the Spaniards, taking advantage of them, were able to repossess themselves of the S. provinces, under the Duke of Parma, whence arose the present distinction between Holland and Belgium. Philip had now set a price on William's head and, in 1582, an attempt was made to assassinate him, but he recovered from the wound. A second attempt, in 1584, was but too successful. One Balthaser Gerard, being introduced to the stadtholder on the plea of business, suddenly drew a pistol loaded with three balls, and shot him in the body at Delft, July 10, 1584.

WILLIAM AND MARY COLLEGE, an educational non-sectarian institution in Williamsburg, Va.; founded in 1693; reported at the close of 1919: Professors and instructors, 15; students, 232; president, J. A. C. Chandler, Ph. D.

WILLIAM HENRY, FORT, a fort at the head of Lake George, N. Y.; in the town of Caldwell. It was taken from the English by the French and Indians under Montcalm, in August, 1757.

WILLIAM OF MALMESBURY, an English historian; born about 1095. He was librarian of the monastery at Malmesbury. He wrote: "History of the English Kings," and its continuation "Modern History," the two being the source from which all subsequent histories of England have drawn; "History of the Prelates of England"; "Lives" of St. Patrick, St. Dunstan, St. Wulfstan; several books of miracles; etc. He died in Malmesbury, about 1142.

WILLIAM OF NEWBURGH, an English chronicler, one of the chief authorities for the reign of Henry II.; born in Bridlington, Yorkshire; lived from 1135 to 1200. His "History of Affairs in England" is divided into five books, extending from 1066 to 1198. It is clear, sound, and unprejudiced, the characters drawn with discrimination, and the narrative is especially valuable as an authority on the struggle between Becket and the king.

WILLIAM OF TYRE, a Syrian historian; born about 1137. He was Archbishop of Tyre (1175). He wrote "History of the Sovereigns of the East," and "History of Events in the Lands Across the Sea," a fine record of the Crusades from 1127 to 1184, first printed in 1549. There are German and French translations of the latter.

WILLIAM OF WYKEHAM, an English statesman; born in Wykeham, Hampshire, England, in 1324. He received a liberal education from the lord of the

manor of Wykeham, and was afterward recommended by him to the notice of Edward III. Having taken holy orders he was elevated to the rich see of Winchester, and in 1367 was appointed to the chancellorship of England. He founded (1373) a grammar school at Winchester, which still exists; and about the same time founded a college at Oxford, now called New College. In the last years of his life he rebuilt Winchester Cathedral. He died in 1404.

WILLIAMS, SIR GEORGE, founder of the Young Men's Christian Association; born in Dulverton, Somersetshire, England, Oct. 11, 1821. In 1841 he went to London; gathered together the young men employed in the same establishment as himself, and on June 12, 1844, organized, with 12 of them, a band called the "Young Men's Christian Association," which was designed to be "a society for improving the spiritual condition of young men engaged in the drapery and other trades." He was the first treasurer of the Young Men's Christian Association, and was always devoted to its interests. He was knighted in 1894. He died Nov. 6, 1905.

WILLIAMS, HENRY SMITH, an American physician and author, born in Durand, Ill., in 1863. He graduated from the State University of Iowa in 1887, and from the Chicago Medical School in 1884. From 1898 to 1902, he was engaged in post-graduate work in hospitals in Berlin, Paris, and London, and served as a specialist in mental diseases in several hospitals for the insane. He was medical superintendent of Randall's Island Hospital in 1892. He wrote "The Story of the Nineteenth Century Science" (1900); "The History of Art of Writing" (1902); "The Conquest of Nature" (1911; "The Wonders of Science in Modern Life" (1912); "Miracles of Science" (1913); "Luther Burbank—His Life and Work" (1915). He also edited several sets of volumes, including "The Works of Luther Burbank" (1915).

WILLIAMS, JESSE LYNCH, an American writer, born in Sterling, Ill., in 1871. After graduating from Princeton in 1892, he engaged in newspaper work for several years and in 1895 published "Princeton Stories". This was followed by "The Stolen Story, and Other Newspaper Stories" (1891); "New York Sketches" (1902); "The Married Life of the Frederic Carrols" (1910); "And So They Were Married" (1915). He also wrote several successful plays, including "Why Marry," produced in 1917, when he was awarded the Pulitzer prize by Columbia University for the best American play produced in that year. He was a member of the National Institute of Arts and Letters.

WILLIAMS, JOHN SHARP, a United States Senator from Mississippi, born in Memphis, Tenn., in 1854. He was educated at the Kentucky Military Institute, at the University of Virginia, and at the University of Heidelberg. After studying law, he was admitted to the bar in 1877. In the following year he removed to Mississippi and engaged in cotton planting. He took an active interest in politics and was elected to Congress from the 53d to the 60th Congresses (1893-1911). During his service in the House of Representatives, he served as minority leader and was the Democratic candidate for speaker from the 58th to the 60th Congresses. He was elected to the United States Senate in 1910, and was re-elected in 1916. During his service in the Senate he was a member of the Foreign Relations Committee and of the Finance Committee. He was recognized as one of the strongest Democratic members, both in the House of Representatives and the Senate. He wrote "Permanent Influence of Thomas Jefferson on American Institutions" (1913).

WILLIAMS, JOHN SKELTON, an American banker and public official, born in Powhatan co., Va., in 1865. He was educated at Richmond, Va., and at the University of Virginia. He was the organizer and, from 1899 to 1904, the president of the Seaboard Air Line Railway System, as well as the organizer and president of a number of banks, trust companies, and industrial institutions. In 1901 he was the chairman of the trust company section of the American Bankers' Association. In March, 1913, he was appointed by President Wilson, first assistant secretary of the Treasury, and in January, 1914, comptroller of the currency, to which latter office he was reappointed in 1919, and from which he resigned at the end of Mr. Wilson's second administration in 1921. He was at various times a member of the advisory board of the Interstate Commerce Commission on the valuation of railroad, steamship, telegraph, and telephone lines; a member of the advisory committee to the director-general of railroads for special supervision of railway financing; a member of the Capital Issues Committee; a member of the central committee and the national treasury of the American Red Cross (since 1913); and director of the division of finance and purchases under the director general of railroads.

WILLIAMS, ROGER, the founder of the State of Rhode Island, and nobly distinguished as the first asserter in modern Christendom of the sanctity and perfect freedom of conscience; born in London, England, in 1607; studied at Oxford, entered the Church and naturally joined the Puritan party. To escape the persecutions to which the Puritans were subject in England, he like so many others fled to America to find what was denied them there—freedom to worship God. He arrived at Boston, New England, in 1631, and holding already in perfect clearness the grand truth of which he was the first modern apostle, soon found himself in collision with the churches already existing there; for they still acted on the very principles of which they had been the victims at home. At length, in 1636, he was ordered to embark for England. To avoid this he left Salem in mid-winter, wandered houseless and half-fed for 14 weeks, then found friends and hospitality among the Indians, whose language he had learnt. He preached to them, won their love, and was their friend and peace-maker till his death. He had resolved on founding a new settlement, and after beginning to build and plant at Seekonk, had to abandon the spot, and selected Rhode Island, on which he landed from an Indian canoe, with five comrades, in June, 1636. He called the place "Providence," and commenced building. In the course of two years he was joined by others, and founded a commonwealth in the form of a pure democracy, and his system has had its influence on the whole political history of the State. He showed no spirit of revenge toward those who had persecuted him; and when the colonies were threatened with a general rising of the Indian tribes, he nobly risked his own life, and undertook the mission to the Narragansetts to dissolve the conspiracy, in which he succeeded. To secure the permanent existence of Rhode Island as a separate State, Williams was chosen to visit England in 1643, to obtain a charter. He was received with the greatest favor by the Long Parliament, and took back with him the desired charter. Williams refused the office of governor, to which the colony wished to appoint him; labored on for its good, rewarding himself in doing it; had a warm controversy with George Fox; and died in Providence in 1683.

WILLIAMS, TALCOTT, an American journalist and educator, born in 1849, in Abeih, Turkey, son of an American missionary. He was educated at Amherst College, from which institution, as well as from the University of Pennsylvania, Brown University, and several other universities and colleges, he received honorary degrees. Beginning with 1873, he was on the staff of various newspapers, including the New York "World," the San Francisco "Chronicle," the Springfield (Mass.) "Republican," and the Philadelphia "Press." From 1912 to 1919 he was director of the Pulitzer School of Journalism, Columbia University, New York, becoming emeritus professor of journalism in 1919. He was a member of numerous scientific societies, a trustee of Amherst College, and of the Constantinople College for Girls; and from 1888 to 1914, a member of the board of managers of the Archæological Museum of the University of Pennsylvania. He was also a trustee of the Jeanes Fund and an officer in various philanthropic and other associations, as well as a frequent contributor to literary and philosophical journals.

WILLIAMSBURG, a city and county-seat of James City co., Va.; on the Chesapeake and Ohio railroad; 48 miles S. E. of Richmond. It was established in 1632, and is the oldest incorporated town in the State. Prior to the Revolutionary War it was the capital of the province; and was also the State capital till 1779. Williamsburg is the seat of WILLIAM AND MARY COLLEGE (*q. v.*), and the Eastern Lunatic Asylum, which was opened in 1773, and is the oldest institution of its kind in the United States. The city has other historic interests. On May 3, 1862, when the Confederates withdrew from YORKTOWN (*q. v.*) they fell back to Williamsburg and erected breastworks about 2 miles E. of the city. The Union forces under General Sumner followed, and on May 5 assaulted the Confederate position. The action lasted from early morning till night. General Hancock won the day by pretending to retreat, and then charging the pursuing enemy, who were completely routed. The total loss of the Union forces was 2,283; that reported by the Confederates, 1,560. Pop. (1920) 2,462.

WILLIAMS COLLEGE, an educational non-sectarian institution in Williamstown, Mass.; founded in 1793; reported at the close of 1919: Professors and instructors, 47; students, 480; president, Henry A. Garfield, LL. D.

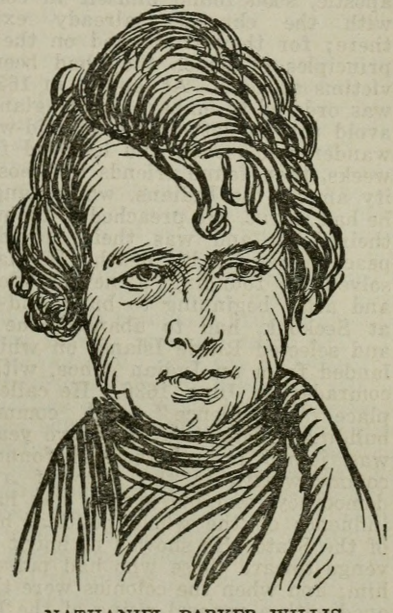
WILLIAMSON, CHARLES NORRIS, a British journalist and author, born in Exeter, England, in 1859. He was educated at the University College, London, and, after studying science and engineering for some years, he joined the

staff of the "Examiner," in 1881. Later he was a member of the editorial staff of the "Graphic." In 1891 he founded "Black and White." He wrote "Life of Thomas Carlyle" (2 vols., 1881), and many articles on travel, automobiling, and other topics. He is particularly well known, however, for the many stories written in collaboration with his wife, ALICE MURIEL (LIVINGSTON) WILLIAMSON. The latter was born at Livingston Manor House, N. Y. Their joint publications include "The Lightning Conductor"; "The Princess Passes"; "My Friend the Chauffeur"; "Lady Betty Across the Water"; "The Car of Destiny"; "Rosemary in Search of a Father"; "The Motor Chaperon"; "Scarlet Runner"; "Set in Silver"; "The Motor Maid"; "Lord Loveland Discovers America"; "The Golden Silence"; "The Princess Virginia"; "The Guests of Hercules"; "The Heather Moon"; "The Demon"; "The Love Pirate"; "It Happened in Egypt"; "Secret History"; "The Shop Girl"; "The Lightning Conductress"; "The War Wedding"; "Crucifix Corner."

WILLIAMSPORT, a city and county-seat of Lycoming co., Pa.; on the Susquehanna river, and on the Philadelphia and Reading, the New York Central, and the Pennsylvania railroads; 94 miles N. of Harrisburg. It is a popular summer resort, surrounded by high hills and attractive scenery. Here are a United States Government building, Dickinson Seminary for Girls, high school, public libraries, Home for the Friendless, hospital, street railroad and electric light plants, waterworks, National, State and other banks, numerous churches, and several daily and weekly newspapers. The industries include rubber works, a silk mill, lumber mills, iron furnace, carriage factories, sewing machine works, paint, soap, glue, and furniture factories, etc. Pop. (1910) 31,860; (1920) 36,198.

WILLIMANTIC, a city of Windham co., Conn.; on the Willimantic river, and on the New York, New Haven and Hartford, the New England, and the Central Vermont railroads; 32 miles S. E. of Hartford. It contains numerous churches, an academy, State Normal Training School, convent, Dunham Hall, public libraries, waterworks, electric lights, National and savings banks, and several newspapers. The river here falls 100 feet and affords abundant power. There are extensive manufactures of spool cotton, cotton, silk, and woolen goods, silk machinery, tinware, ironware, etc. Pop. (1910) 11,230; (1920) 12,330.

WILLIS, NATHANIEL PARKER, an American author; born in Portland, Me., Jan. 20, 1806; was educated at Boston, Andover, and Yale College; employed by S. P. Goodrich (Peter Parley) to edit "The Legendary" (1828) and "The Token" (1829); established the "American Monthly Magazine," which was merged in the "New York Mirror"; traveled in France, Italy, Greece, European Turkey, Asia Minor, and finally England; returned to America in 1837, and afterward edited "The Home Journal." His numerous published writings include "Pencillings by the Way" (1835); "Inklings of Adventure" (1836); "Loiterings of Travel" (1839); "People I Have Met" (1850); "Famous Persons and Places" (1854); "Outdoors at Idlewild" (1854); "The Convalescent, His Rambles and Adventures" (1859). He died near Newburgh, N. Y., Jan. 20, 1867.



NATHANIEL PARKER WILLIS

WILMERDING, a borough of Pennsylvania, in Allegheny co. It is on the Pennsylvania railroad. Its industries include foundries and machine shops of the Westinghouse Air Brake Company. Pop. (1910) 6,133; (1920) 6,441.

WILMINGTON, a city of Delaware, the county-seat of Newcastle co. It is on the junction of the Delaware, Christiana, and Brandywine rivers, and is on the Pennsylvania, the Baltimore and Ohio, and the Philadelphia and Reading

railroads. There are also five suburban trolley lines, which lead in all directions from the city. Wilmington is the metropolis of Delaware, and is 27 miles S. W. of Philadelphia and 67 miles N. E. of Baltimore. It is most attractively situated in the valley of the Brandywine. There are within the city limits 148 miles of streets, of which over 80 miles are paved. There are 123 miles of sewers. The city is unusually well lighted. The main park system along the Brandywine creek covers over 500 acres, and there are 18 smaller parks in congested centers. There are many playgrounds and athletic fields throughout the city. Municipal swimming pools are maintained. The industries of the city are of great importance. They include sugar refineries, flour mills, paper mills, manufactures of knit goods, leather, ships, railroad cars, dynamite and other explosives, aluminum astings, valves, etc. The first railroad cars used in the United States were built at Wilmington. The city has daily steamboat communication with Philadelphia and there is a motor transport service to Philadelphia, New York, and Baltimore. There are 10 banks and trust companies with deposits of over $60,000,000. The bank clearings in 1919 amounted to $188,439,-969. The great Du Pont powder works are located in the city. The harbor of the city has been greatly improved in recent years, and many docks and bulkheads have been built which give excellent facilities for unloading cargoes. The city has an excellent school system, and also several important educational institutions, including the State Industrial School for Girls, State Asylum for Insane, and other public institutions.

The first settlement was made by the Swedes in 1638. It was called Fort Christiana. This was captured by the Dutch in 1655, and called Fort Altena, and the town was named Christianaham. In 1731 the village of Willingtown, named thus in honor of Thomas Willing, was founded. The name was subsequently converted into Wilmington. The place received its city charter in 1832. The Old Swedes' church, erected in 1698, is still used. Pop. (1910) 87,411; (1920) 110,168.

WILMINGTON, a city, port of entry, and county-seat of New Hanover co., N. C.; on Cape Fear river, and on the Atlantic Coast Line, the Seaboard Air Line, and the Cape Fear railroads; 214 miles N. E. of Charleston, S. C., and 26 miles W. of the Atlantic Ocean. It is the most important commercial port of the State. There are steamboat lines to Baltimore, Charleston, and points on the Cape Fear river. Here are a United States Government building, a State armory, United States Marine Hospital, high school, the Gregory Normal Institute, waterworks, electric lights, street railroads, public library, National and State banks, and a number of daily, weekly, and monthly periodicals. The industries include the manufacture of cotton goods, lumber, flour, turpentine, fertilizers, foundry products, etc. During the Civil War the city was one of the chief ports of the Confederacy, and a notable resort for blockade runners, until captured by General Terry in 1865. Pop. (1910) 25,748; (1920) 33,372.

WILMOT PROVISO, a notable resolution introduced into the United States Congress by David Wilmot. On Aug. 8, 1846, pending the consideration in Congress of a bill placing $2,000,000 at the disposal of President Polk to negotiate a peace with Mexico, David Wilmot, a representative from Pennsylvania, offered the following amendment: "Provided that, as an express and fundamental condition to the acquisition of any territory from the republic of Mexico by the United States, by virtue of any treaty which may be negotiated between them, and to the use by the Executive of the moneys therein appropriated, neither slavery nor involuntary servitude shall ever exist in any part of said territory, except for crime, whereof the party shall be duly convicted." This was the famous "Wilmot Proviso," which became the source of great agitation throughout the country. It was adopted in the House by a vote of 94 to 78, and was under debate in the Senate when the hour arrived previously fixed for the adjournment of the session. At the next session, Mr. Wilmot again introduced it, and a fierce and angry contest commenced. The House remained firm in favor of the amendment, and it was passed by a decided majority, but not acted on by the Senate.

WILSON, a city of North Carolina, the county-seat of Wilson co., on the Atlantic Coast Line and the Norfolk Southern railroads. It is the center of an important farming, cotton growing, and tobacco raising region. Its industries include the manufacture of carriages, foundry products, lumber, cotton and oil mills, and tobacco factories. Pop. (1910) 6,717; (1920) 10,612.

WILSON, ALEXANDER, a Scotch-American ornithologist; born in Paisley, Scotland, July 6, 1766. In early life he was a weaver and teacher. He published a volume of poems in 1790, but being sentenced for a lampoon in 1793, emi-

grated to America. He was employed as editor of the American edition of Rees's "Cyclopædia"; but in his wanderings as peddler, he learned to love birds, and set about writing an ornithology. At his death seven volumes of this work had been published; the eighth and ninth volumes were edited by George Ord, and a continuation by Charles Lucien Bonaparte (4 vols. 1825-1833). Volumes of his poems were published at Paisley in 1816, and at Belfast in 1857. He died in Philadelphia, Pa., Aug. 23, 1813.

WILSON, AUGUSTA JANE (EVANS), an American novelist; born near Columbus, Ga., in May, 1835. She lived some years in Texas; afterward at Mobile, Ala. Her works had great popularity. They include: "Inez" (1856); "Beulah" (1859); "Macaria" (1864); "St. Elmo" (1866); "Vashti" (1869); "Infelice"; and "At the Mercy of Tiberius." She died May 9, 1909.

WILSON, SIR DANIEL, a Canadian educator; born in Edinburgh, Scotland, Jan. 5, 1816; received a classical education and on leaving college in 1837 went to London and there adopted literature and journalism as a profession. A few years later he returned to Edinburgh where he studied archæology; became secretary of the Scottish Society of Antiquarians and undertook the editorship of its "Proceedings." In 1853 he was made Professor of English Literature and history in University College, Toronto, where he remained till 1880, when he was called to the presidency of Toronto University. On the formation of the Royal Society of Canada, in 1882, he was elected chairman of the section of History, Archæology, and English Literature; and succeeded to the presidency of the society in 1885. In 1888 he was knighted by the queen. Sir Daniel was also a fellow of the Royal Societies of Edinburgh, Italy, and Copenhagen; the founder of the Newsboys' Home in Toronto; chairman for several years of the Ontario Teachers' Association; president of the Young Men's Christian Association in Toronto; and the author of "Memorials of Edinburgh in the Olden Time"; "Prehistoric Annals of Scotland"; "Chatterton: a Biographical Study"; "Spring Wild Flowers"; and numerous contributions to periodical literature, etc. He died in Toronto, Canada, Aug. 7, 1892.

WILSON, FRANCIS, an American actor, born in Philadelphia, in 1854. He made his first appearance on the stage in legitimate comedy in 1877. In 1885 he became leading comedian of the McCaull Opera Company, in New York. Here he created the character of Cadeaux in "Erminie." He afterward organized his own opera company and appeared in many comic operas. He also appeared in plays under the supervision of Charles Frohman. He was the author of "The Eugene Field I Knew"; "Recollections of a Player"; "Joseph Jefferson." He wrote several plays, including "The Magic Ring"; "The Bachelor's Baby"; "The Dancing Master"; and "Making Good."

WILSON, HARRY LEON, an American editor and writer, born in Oregon, Ill., in 1867. He was educated in the public schools, and from 1896 to 1902 was editor of "Puck." He published "The Spenders" (1902); "The Seeker" (1904); "Ewing's Lady" (1907); "Bunker Bean" (1912); "Ruggles of Red Gap" (1915); "Somewhere in Red Gap" (1916); "The Wrong Twin" (1920). He was a member of the National Institute of Arts and Letters.

WILSON, HENRY (born JEREMIAH JONES COLBAITH), an American statesman; born in Farmington, N. H., Feb. 16, 1812; was mainly self-educated and learned the trade of shoemaking. On attaining his majority he had his name changed by the legislature to that by which he was best known. He became an abolitionist in 1835; supported William Henry Harrison for the presidency in 1840, speaking at over 60 Whig gatherings; was elected to the Massachusetts House of Representatives in the same year; and held a seat in the State Senate in 1842-1845; was re-elected to the Senate in 1850, and was its president for two years. In 1855 he was elected to the United States Senate. On May 22, 1856, Charles Sumner, his colleague, was assaulted by Preston S. Brooks, and on the next day Senator Wilson pronounced the action "brutal, murderous, and cowardly." Soon afterward Brooks challenged Wilson to a duel, but the latter refused on the ground that duelling was both unlawful and barbarous. During his career in the Senate he was a fearless opponent of slavery. He was re-elected to the Senate; in 1861 became chairman of the Committee on Military Affairs. In this capacity, at the beginning of the Civil War, he influenced Congress to pass an act permitting the recruiting of 500,000 men. He was a third time returned to the Senate and there remained till elected Vice-President of the United States in 1872, on the ticket with General Grant. His notable addresses include "Defense of the Republican Party" (1856); "Are Workingmen Slaves?"; "The Death of Slavery

is the Life of the Nation"; "The Republican and Democratic Parties" (1868); etc. He also was the author of "History of the Anti-Slavery Measures of the Thirty-seventh and Thirty-eighth United States Congresses" (1865); "Military Measures of the United States Congress" (1866); "Testimonies of American Statesmen and Jurists to the Truths of Christianity" (1867); "History of the Reconstruction Measures of the Thirty-ninth and Fortieth Congresses, 1865-1868" (1868); "History of the Rise and Fall of the Slave Power in America" (3 vols. 1872-1875); etc. He died in Washington, D. C., Nov. 22, 1875.

WILSON, HENRY LANE, an American diplomat, born in Crawfordsville, Ind., in 1857. He was educated at Wabash College and received the degree of Ph. D. from the National University of Chile, in 1911. From 1882 to 1885 he was editor of the Lafayette (Ind.) "Journal," and from 1885 to 1896 he was engaged in the practice of law and in banking in Spokane, Wash. In 1889 he was appointed minister to Venezuela, by President Harrison, but declined. From 1897 to 1905 he was United States minister to Chile, and from 1905 to 1910 United States minister to Belgium. Appointed ambassador to Turkey in 1909, he was transferred to Mexico before taking charge, serving in the latter country from 1909 to 1913, when he resigned.

WILSON, JAMES, an American agriculturist; born in Ayrshire, Scotland, Aug. 16, 1835. He removed with his father to the United States in 1852, and in 1855 settled in Iowa. He served three terms in the Iowa Legislature, being speaker for two years. He was elected to the 43d, 44th and 48th Congresses. In 1891 he was Professor of Agriculture in the Iowa Agricultural College. In 1897 he was appointed Secretary of the Department of Agriculture in the cabinet of President McKinley; was reappointed in 1901; and retained by President Roosevelt on his accession the same year. He died in 1920.

WILSON, JAMES GRANT, an American author; born in New York City, April 28, 1832; served in the Civil War. Besides numerous addresses, essays, and articles in periodicals, he published: "Biographical Sketches of Illinois Officers" (1862-1863); "Love in Letters. Illustrated in the Correspondence of Eminent Persons" (1867); "Life of General Grant" (1868-1885); "Life of Fitz-Greene Halleck" (1869); "Sketches of Illustrious Soldiers" (1874); "Poets and Poetry of Scotland" (1876); "Centennial History of the Diocese of New York, 1775-1885" (1886); "Bryant and His Friends" (1886); "Commodore Isaac Hull and the Frigate Constitution" (1889); Life of General Grant" (1897); "The President of the United States" (1901); etc. He was the editor (with John Fiske) of "Appleton's Cyclopædia of American Biography" (6 vols. 1886-1889), and alone of "Memorial History of the City of New York." He died in 1914.

WILSON, JAMES HARRISON, an American military officer; born in Shawneetown, Ill., Sept. 2, 1837; was graduated at the United States Military Academy in 1860 and assigned to the Department of Oregon in the topographical engineer service. During the Civil War he served with distinction as an engineer, notably at the Richmond raid and the operations near Petersburg. He commanded the 3d Division of Sheridan's cavalry in 1864; participated in the capture of Fort Pulaski and the campaigns of Antietam, Vicksburg, Chattanooga, and the Wilderness; commanded in the assault and capture of Selma and Montgomery, Ala., Columbus and Macon, Ga., and took a leading part in the capture of Jefferson Davis. On July 28, 1866, he was brevetted Major-General, U. S. A., for gallant and meritorious services during the war, and on Dec. 31, 1870, was honorably discharged at his own request. After leaving the army he was engaged in large railroad and engineering operations both in the United States and abroad, and on the outbreak of the Spanish-American War was appointed Major-General of volunteers and was assigned to the command of the 1st Division, 1st Army Corps, in the campaign in Porto Rico. His publications include "China, Travels and Investigations in the Middle Kingdom"; "Life of Andrew Alexander"; "Life of General Grant"; etc.

WILSON, JEREMIAH MORROW, an American jurist; born in Warren co., O., Nov. 25, 1828; received an academic education; was judge of the Court of Common Pleas of Fayette co., Ind., in 1860-1865; judge of the Circuit Court in 1865-1871; member of Congress in 1871-1875; declined a renomination; resumed the practice of law in Washington, D. C. During his professional career in that city Judge Wilson was connected with numerous famous cases. Besides having acted as attorney for the Union Pacific railroad and the Mormon Church, he was counsel for the plaintiff in the Breckinridge-Pollard breach of promise

suit, defended the sugar witnesses who had refused to testify before a Senate committee; was counsel in the court-martial of General Swain, and was connected with the "Alabama Claims" and the French "Spoliation" cases; etc. In 1901, after the Navy Department had granted the request of Admiral Schley for a court of inquiry, the admiral chose Judge Wilson as his chief counsel. While serving as such Judge Wilson died suddenly in Washington, D. C., Sept. 24, 1901.

WILSON, JOHN, pseudonym, CHRISTOPHER NORTH, a Scotch author; born in Paisley, Scotland, May 18, 1785; was educated at Glasgow University and at Magdalen College, Oxford; noted as a scholar and athlete; settled in Cumberland, and became one of the "Lake Group" with Wordsworth, De Quincey, Southey, and Coleridge. Losing most of his inherited fortune, he removed to Edinburgh and studied law. From the starting of "Blackwood's Magazine" in 1817 he was a chief contributor, and was for many years its generally accredited head. For it he wrote (with Maginn and others, but largely alone) the "Noctes Ambrosianæ," by which he is best remembered—imaginary dialogues at Ambrose's tavern in Edinburgh, between the leading contributors to the magazine; a selection from these was published in 1876. He also wrote among other things: "The Isle of Palms" (1812), and "The City of the Plague" (1816), poems; "Lights and Shadows of Scottish Life" (1822); "The Trials of Margaret Lindsay" (1823); "The Foresters" (1825); and "Essay on the Genius and Character of Burns" (1841). He was Professor of Moral Philosophy at Edinburgh University from 1820 to near the end of his life. He died in Edinburgh, April 3, 1854.

WILSON, JOHN, a Scotch missionary; born near Lauder, Scotland, Dec. 11, 1804; was educated at the University of Edinburgh, went out to Bombay in the service of the Scottish Missionary Society, and in 1843 transferred his labors to the mission work of the Free Church of Scotland. He established numerous schools; became vice-chancellor of the University of Bombay; contributed largely to the abolition of the practice of suttee; traveled all over India establishing missionary centers; and was universally honored and beloved by the natives. His linguistic ability was remarkable, and his contributions to literature included: "The Parsi Religion" (1842); "India Three Thousand Years Ago" (1857); "Memoirs on the Cave-Temples of India" (1859); "The Lands of the Bible Visited and Described" (1867); and "Indian Caste" (1877). He died in Edinburgh, Scotland, Dec. 1875.

WILSON, SIR ROBERT THOMAS, an English military writer; born in London, England, in 1777. He served in the Peninsular war; was British military commissioner at the Russian and Allied headquarters, 1812-1814; member of Parliament and governor of Gibraltar, 1842-1849. He wrote: "History of the British Expedition to Egypt" (1802); "Sketches of the Campaigns in Poland" (1810); "Military and Political Power of Russia" (1817); "Narrative of Events During the Invasion of Russia, 1812" (1860); "Diary" (1861); etc. He died in London, May 9, 1849.

WILSON, THOMAS, an English clergyman; born in Burton, England, Sept. 20, 1663; studied at Trinity College, Dublin, and served as curate of Newchurch Kenyon from 1686 till 1692, when he became chaplain to the Earl of Derby, who appointed him Bishop of Sodor and Man in November, 1697. For 58 years he governed his diocese with constant care. His "Principles and Duties of Christianity" (1707), commonly called the Manx Catechism—the first book printed in the native tongue—and his "Essay Toward an Instruction for the Indians," written for Oglethorpe's Georgia plantation scheme, and submitted to Isaac Watts (published only in 1740), were combined to form "The Knowledge and Practice of Christianity Made Easy to the Meanest Capacities" (1775). But his name best survives in his admirable "Short and Plain Instructions for the Better Understanding of the Lord's Supper" (1736), and "Sacra Privata, Private Meditations, Devotions and Prayers" (1800). Other books are "Parochialia, or Instructions for the Clergy" (1788), and "Maxims of Piety and Christianity" (1789). He instituted a Manx translation of the Bible, which was completed 1772-1775. He died March 7, 1755.

WILSON (THOMAS) WOODROW, 28th President of the United States, was born of Scotch-Irish ancestry at Staunton, Va., Dec. 28, 1856. His father was the Rev. Joseph R. Wilson, a Southern Presbyterian minister, who gave much of his time to teaching; his mother was Jenet (Jessie) Woodrow. Educated in youth at various Southern schools and having spent about a year at Davidson College (N. C.); he went to Princeton, where he distinguished himself in debating and literary work, graduating 1879, ranking 38th in a class of 106. He

studied law at the University of Virginia (1879-1881) and practiced for a year at Atlanta, Ga. (1881-2). Thence he went to Johns Hopkins University, where he studied political science (1883-5), taking the degree of Ph. D. (1886) with an unusually brilliant thesis. The next twenty-five years of his life (1885-1910) were spent almost entirely in educational work, although he always took an active interest in public affairs. From 1885 to 1888 he was associate professor of history and political economy at Bryn Mawr; from 1888 to 1890 professor of the same subjects at Wesleyan; and from 1890 to 1910 he was on the faculty of Princeton University; from 1890 to 1895 as professor of jurisprudence and political economy; from 1895 to 1897 as professor of jurisprudence; from 1897 to 1910 as professor of jurisprudence and politics. From 1902 to 1910 he was president of Princeton, being the first layman to occupy that position. During his presidency some notable reforms were brought about in the college, chief among them the introduction of the preceptorial system. Mr. Wilson set his mind so firmly on improving the scholastic standards of Princeton that among certain of the alumni it was said that he was trying to turn the dear old college into a confounded educational institution. His attempt to change the "club" system and other efforts to make Princeton more democratic led to much friction; and it is no secret that he gladly availed himself of the opportunity honorably to withdraw when on Sept. 15, 1910, there was offered to him the Democratic nomination for governor of New Jersey.

Mr. Wilson's entrance into public life was by no means unusual or sensational. He had for many years given expression to his views on public affairs and had been known as one of the most progressive and thoughtful leaders in the Democratic party. He conducted the campaign in a forceful and high-toned manner, and was elected governor by the large plurality of 49,056, although in 1908 the Republicans had carried the State by more than 82,000. He was governor of New Jersey from Jan. 17, 1911, to March 1, 1913. In this office Wilson carried through some admirable reform measures including the direct primary law, corrupt practices act, a reorganization of the school system of the State, and a model employers' liability law. But perhaps the most noteworthy feature of his administration was the better control of corporations through the bills popularly known as the "Seven Sisters," Some of these laws have been copied by other States.

In 1911 there were many indications that Governor Wilson was being seriously considered as a Presidential candidate; and during the next year his candidacy got much popular support. On July 2, 1912, in Baltimore, in one of the most spectacular conventions ever held by the Democratic party, on the 46th ballot Woodrow Wilson received the nomination. Thomas R. Marshall, of Indiana, was nominated for Vice President. The disruption of the Republican party by the Progressive movement caused Governor Wilson to receive an extraordinary majority in the electoral college. He received 435 electoral votes; Roosevelt had 88; and Taft 8. In the popular vote Wilson had 6,286,214; Roosevelt, 4,126,020; Taft, 3,483,922.

Wilson was inaugurated March 4, 1913, with a Democratic majority in both branches of Congress. The first year of his administration was marked by the passage of much important legislation, notably the revision of the tariff by the Underwood-Simmons bill, and the reform of the currency by the Federal Reserve Act, probably, as the "Banker's Magazine" said, "the most comprehensive piece of banking legislation ever enacted in this country." In the realm of foreign affairs the President had to face in the first months of his term grave problems in the Philippine Islands and in Mexico. In the former, where there was much unrest, he labored with some success for conciliation and harmony. The Mexican situation was one of great complexity. Wilson refused to recognize Huerta, while disavowing any desire to interfere with Mexico's affairs. He adopted the policy of "watchful waiting," but was obliged, owing to attacks made by Mexicans on Americans, to occupy Vera Cruz in April, 1914. Wilson promptly accepted a proposal from Argentina, Brazil and Chile to mediate; and although the conference of the A, B, C powers at Niagara Falls, was without definite result, it brought about better understanding. In July, 1914, Huerta left the country; in November, the American forces evacuated Vera Cruz, and Wilson's policy accomplished much without plunging the country into war.

The remaining two years of his first administration were mainly concerned with the issues raised by the World War. As soon as the war broke out, he tendered his good offices to any and all of the warring nations. Thence he was occupied for some months in preserving America's neutrality and at the same time in defending her rights. The years were very troubled ones, marked by the sinking of the "Lusitania," German plots,

and the recall of Dumba, the Austro-Hungarian minister at Washington, and of Captains Boy Ed and Von Papen, German attachés. In December, 1915, President Wilson sent a message to Congress in which he advocated more stringent Federal laws to protect the country against such plots, and also measures of military and naval preparedness.

In July, 1916, Wilson was unanimously renominated for President by the Democratic National Convention at St. Louis; and on November 7, 1916, was re-elected, receiving 277 electoral votes to 254 cast for the Republican nominee, Charles E. Hughes. In the popular vote, Wilson had a plurality of 581,941, receiving 9,129,269 votes to 8,547,328 cast for Hughes. One of the features of the election was that the vote of California, which was decisive, was so close that the final result was not known until some days after the election.

The second administration of President Wilson was one of the most momentous in American history. In February, 1917, the German ambassador to the United States was given his passports; and in April the United States entered the war. The President who in a remarkable series of state papers had made the issues of the war clear had behind him a united people; and the American army and navy were decisive factors in securing the final military triumph of the Allied and Associated Powers. During the peace negotiations, which followed the signing of the armistice on Nov. 11, 1918, Wilson broke one of the traditions of the Presidential office by himself going to Paris as head of the American peace delegation. He took a very prominent part in the making of the treaty of Versailles, particulary in the section of the treaty dealing with the League of Nations. The treaty, however, met with bitter opposition in the Senate and failed of the two-thirds vote necessary for ratification. Consequently the treaty became one of the leading issues in the presidential campaign of 1920, as the Democrats under the leadership of Governor Cox, of Ohio, indorsed Wilson's position, while the Republicans led by Senator Harding, of Ohio, approved the stand of the Senate in refusing to ratify without certain reservations. In September, 1919, while on a tour of the country to win popular support for the League of Nations, Wilson had a serious physical breakdown. Mr. Wilson took no active part in the election of 1920, although he cordially supported Gov. Cox. Following the inauguration of Senator Harding, he retired to private life in Washington. He formed a partnership with Bainbridge Colby, former Secretary of State, for the practice of international law.

Mr. Wilson married Ellen Louise Axson, of Savannah, Georgia, June 24, 1885, by whom he had three daughters. She died August 6, 1914. On Dec. 18, 1915, he married Mrs. Edith Bolling Galt, of Washington.

As an author, Mr. Wilson was known by several important works on government and history. These included "Congressional Government" (1885); "The State" (1889); "George Washington" (1896); "A History of the American People" (1902); "The New Freedom" (1913). He was also an essayist of distinction, "Mere Literature and Other Essays" (1893); "On Being Human" (1916).

WILSON, WILLIAM BAUCHOP, an American public official, born in Blantyre, Scotland, in 1862. In 1870 he removed to the United States and was educated in the common schools of Philadelphia. From 1871 to 1898 he was engaged as a miner, and from 1888 to 1890 he was president of the District Miner's Union. He was a member of the national executive board which organized the United Mine Workers of America. In 1900 he was secretary and treasurer of the National Union of Miners. In 1907 he was elected to Congress and served until 1913. He was appointed Secretary of Labor by President Wilson and served in that office throughout Mr. Wilson's presidency.

WIMBLEDON COMMON, an open, breezy heath of 628 acres, 7 miles S. W. of London. Here from 1860 till 1889 in July was held the annual meeting of the National Rifle Association, since transferred to Bisley near Woking. Linnæus here first saw the gorse in bloom; and here many duels were fought. Wimbledon now is practically a suburb of London, with a number of magnificent houses. Pop. about 60,000.

WINCHELL, ALEXANDER, an American geologist; born in Dutchess co., N. Y., Dec. 31, 1824. He lectured extensively and contributed to many journals. His writings include: "Sketches of Creation" (1870); Geological Chart" (1870); "The Doctrine of Evolution" (1874); "Science and Religion" (1877); "Preadamites" (1880); "Sparks from a Geologist's Hammer" (1881); "World and Life" (1883); "Geological Excursions" (1884); "Geological Studies" (1886); and "Walks and Talks in the Geological Field" (1886). He died in Ann Arbor, Mich., Feb. 19, 1891.

WINCHESTER, a famous city of Hampshire, England, on the Itchen. The Castle Hill is the site of the old castle, or royal palace, built in the 13th century by Henry III., and of a magnificent hall, of which the only remaining portion is used as the county court. The cathedral is a beautiful and imposing pile. The college of Winchester was founded by William of Wykeham, Bishop of Winchester, in 1387. The industries of Winchester are unimportant. Winchester, the Roman Venta Belgarum, was the site of a British city before the arrival of the Romans in Britain, Caer-Gwend. It afterward became a Roman station, and as such was a place of considerable importance, and contained temples of Apollo and Concord. Pop. about 25,000.

WINCHESTER, a town and county-seat of Clark co., Ky.; on the Louisville and Nashville, the Chesapeake and Ohio, and other railroads; 18 miles E. of Lexington. It is in the celebrated "Blue Grass" region. Here are the Kentucky Wesleyan College, Winchester Female College, the Cooper Female Institute, street railroad and electric light plants, waterworks, National and State banks, and several newspapers. The principal industries are agriculture and stock raising. Pop. (1910) 7,156; (1920) 8,333.

WINCHESTER, a town of Massachusetts, in Middlesex co., on the Boston and Maine Railroad and chiefly a residential suburb of Boston. It contains Middlesex Fells, a State park. It has a public library, a hospital, and a home for aged people. Its industries include the manufacture of leather, machinery, soda fountains, felt goods, etc. Pop. (1910) 9,309; (1920) 10,485.

WINCHESTER, a city and county-seat of Frederick co., Va.; on the Cumberland Valley and the Baltimore and Ohio railroads; 88 miles W. by N. of Washington, D. C. It is in a beautiful and fertile country, which is part of the great Shenandoah valley of Virginia. The houses are built in a compact and substantial manner, mostly of brick and stone. Here are numerous churches, National and other banks, Fairfax Hall for Girls, the Valley Female College, the Shenandoah Valley Academy, and several weekly newspapers. The city has glove factories, paper mill, flour mills, broom factory, foundries, and cigar factories. The city is the key to the Shenandoah valley. During the Civil War it was many times taken and retaken by the opposing armies, and several battles were fought near it. Pop. (1910) 5,864; (1920) 6,883.

WINCHESTER, BATTLE OF, the name of several engagements in the American Civil War. The most important were: (1) A battle fought at Kernstown, Va., near Winchester, March 23, 1862, between the Federals under General Shields and the Confederates under General Jackson, in which the former were victorious. This battle is sometimes called the battle of Kernstown. (2) A victory gained by the Confederates, under General Early, over the Federals under General Crook, July 24, 1864. (3) A battle fought by the Federals under General Sheridan and the Confederates under General Early, at Winchester, Va., Sept. 19, 1864. The latter were defeated with a loss of 5,000 men.

WINCKELMANN, JOHANN JOACHIM, a German archæologist, the founder of scientific archæology and of classic art history; born in Stendal, Germany, Dec. 9, 1717. He was the first to consider the masterpieces of classical antiquity as representative of a stage in the development of taste, and to formulate the theory of evolution in art. He seems to have obtained his first clue from some observation of Velleius Paterculus and Quintilian. His greatest work is a "History of the Art of Antiquity" (1764), later on supplemented by "Observations on the History of Art" (1767). He also published: "Thoughts on the Imitation of Greek Works in Painting and Sculpture" (1755); "Architecture of the Ancients" (1762); "Unknown Memorials (or Monuments) of Antiquity" (1767); and many essays and pamphlets. He died in Trieste, June 8, 1768.

WIND, air in motion; the distributer of heat and moisture over the earth's surface; thus constituting a principal factor of what is called the weather. Any cause which disturbs the equilibrium of pressure of the atmosphere will give rise to aërial currents. The most potent causes are variations in temperature and in amount of aqueous vapor. Winds will always blow or tend to blow, from the regions of higher to regions of lower pressure, and the greater this difference, or, as the meteorologist expresses it, the steeper the gradient, the greater will be their force or intensity. The study of the action of the wind thus takes into account the differential pressure producing it, its direction, and its velocity; and for the sake of convenience of record and discussion winds are classified according to their character as permanent, periodical, and variable; with respect to direction, we distinguish between horizontal, vertical, inclined,

and spiral movements. Various scales are in use; the seaman is generally satisfied with eight divisions, viz., the directions of the cardinal points and the four intermediate points. On land, when greater precision can be had, as many as 32 equidistant compass directions may be employed, but in more refined discussions the ordinary divison of the circle into degrees has been used. With respect to velocity, the scales adopted in different countries, and used on land or sea, vary likewise according to the degree of precision desired.

Storm warnings, as dangerous to navigation, are given when the wind velocity reaches or surpasses 35 miles an hour. During cyclonic storms or tornadoes the velocity is often very much greater, and may approach the upper limit of our scale. Generally the greater the elevation of a place above the sea-level the greater the velocity of the wind, and winds blow stronger at sea than over land.

Of the periodical winds, blowing half a year in one, and the other half in the other direction, the monsoons are the most noteworthy, in particular those of southern Asia, where from October to April the N. W. and from April to October the S. W. winds are blowing with great steadiness. Their reversal in May and October is often accompanied by violent hurricanes and deluges of rain. Monsoons are the direct consequence of the unequal effect of the sun's heating power over large tracts of land, in contrast with its effects over a large expanse of ocean. On a smaller scale sea and land breezes have a similar origin; on S. shores the land becomes powerfully heated in the day time, while at night its temperature sinks below that of the adjacent ocean. This circumstance gives rise in the morning to the welcome sea breeze, setting in toward land, at first gently, but reaching a stiff breeze at the time of the greatest heat of the day, or about 2 P. M. After this hour it sinks gradually to a calm in the evening, to be followed by the contrary or land breeze, blowing strongly from the land seaward during the night, again dying away in the early morning.

Tornadoes also have their seasons of frequency, occurring in the United States most frequently in April, May, June, and July, in the order named; while the hours of greatest frequency are between half-past three and five o'clock in the afternoon—*i. e.*, soon after the warmest part of the day, when the warm ascending currents are most likely to meet the cooler descending current, to the meeting of which currents the violence of the tornado is, in a great measure, due. We must also notice a remarkable law, known as Dove's or Buys Ballot's, from its importance to the navigator, as its knowledge will enable him to avoid the most destructive part of revolving storms. It has been noticed that in the Northern Hemisphere the wind has a decided tendency to veer round the compass according to the sun's motion, *i. e.*, to pass in the direction (say) from N. through N. E., E., S. E., etc., round to N., and that a revolution in the opposite direction is very rare. Ballot's law may be stated as follows: (1) Stand with your back to the wind, and the center of depression or of lowest barometer will be to your left in the Northern Hemisphere and to your right in the Southern Hemisphere; (2) stand with the high barometric pressure to your right and the low pressure to your left, and the wind will blow on your back, the position to be reversed for the Southern Hemisphere. In general, the resultant wind can be worked out from a knowledge of the isobaric curves, or graduated lines of equal pressure corresponding to the time and place. In cyclones, then, the rotation of the air in the Northern Hemisphere is in a direction contrary to the hands of a watch laid face uppermost, and in the same direction as the hands for the opposite hemisphere. At the equator violent cyclones do not occur. It is well known that at the time the center of a cyclonic depression passes over a place there is a calm or lull in the wind, which lull is preceded and followed by winds of equal violence, but in opposite directions. Anemometers, or instruments which measure the force and direction of the wind, are of two kinds: those which record at stated intervals, and those which give an automatic and continuous registration. Some are self-registering instruments for the direction, others for the pressure of the wind. Of velocity anemometers that of Robinson has a high reputation. It registers the velocity by the revolutions of a vertical shaft connected with arms and hemispherical cups, on which the wind impinges. It thus registers the number of miles passed over by the wind in a given time. See ANEMOMETER; CYCLONE; TORNADO; WEATHER BUREAU.

WINDBER, a borough of Pennsylvania, in Somerset co. It is on the Pennsylvania railroad. Its industries include coal mining, lumbering, and the manufacture of fire brick. Pop. (1910) 8,013; (1920) 9,462.

WINDERMERE, or **WINANDERMERE**, the largest lake in England,

called from its beauty "Queen of the Lakes"; partly in the county of Lancaster, and partly divides that county from Westmoreland. It is nearly 11 miles long and about 1 mile in extreme breadth; fed by the Brathay and the Rothay, the waters of which become united before entering the lake, and by the streams which drain the neighboring lakelets of Esthwaite, Troutbeck, and Blelham; and, lying 134 feet above sea-level, discharges its surplus waters S. into Morecambe Bay by the Leven. Next to Wast Water, Windermere is the deepest of all the English lakes, its greatest depth being 240 feet, while Wast Water is 270 feet deep. It contains a number of islands, the largest being 28 acres in area. Soft rich beauty is the principal characteristic of the islands of the lake, of the wooded shores, and of the scenery around; there being a total absence of that wildness and sublimity which characterize some of the other lakes, except at the N. end, where Langdale Pikes, Harrison Stickle, Sea Fell, and Bow Fell stand forward prominently in the landscape.

WINDHAM, WILLIAM, an English statesman; born in London, May 3, 1750; was educated at Eton, at Glasgow University, and University College, Oxford. In 1784 he was returned to Parliament for Norwich. In 1783, on the formation of the Portland ministry, remarkable for the coalition of Lord North and Mr. Fox, he had become principal secretary to Lord Northington, then lord-lieutenant of Ireland, but ill-health soon obliged him to resign. He followed Burke in his view of the French Revolution, and in 1794 he became secretary-at-war under Pitt. He went out with Pitt in 1701, and denounced Addington's peace of Amiens (1801) in a speech of splendid eloquence. This lost him his seat for Norwich, but he was elected for St. Mawes in Cornwall, and on the return of the Grenville party to power (January, 1806) he became war and colonial secretary. He helped Cobbett to start his "Political Register" (January, 1802), carried a scheme for limited service in the army (1806), and at the general election in October, 1806, found a seat in New Romney, and next year at Higham Ferrers. He went out of office in 1807, when the Portland administration was formed, having previously declined the offer of a peerage, and strongly denounced the expedition against Copenhagen, and afterward the disastrous Walcheren expedition. In 1808 a clause was introduced by his successor, Lord Castlereagh, into the Mutiny Act, permitting men to enlist for life, contrary to Windham's scheme of limited service, which was, however, readopted in 1847. He died June 4, 1810.

WINDMILL, a mill which receives its motion by the wind acting on sails, and which is used for grinding grain, raising or pumping water, and other purposes. When wind is employed as the first mover of machinery, it may be applied in two ways: (1) By receiving it on sails which are nearly vertical, and which give motion to an axis nearly horizontal, in which case the machine is called a vertical windmill, or (2) by receiving it on vertical sails which move in a horizontal plane, and give motion to a vertical axis, in which case it is called a horizontal windmill. Sometimes the whole mill is made to turn on a strong vertical post, and is then called a post mill; but more commonly the roof or head only revolves, carrying with it the wind wheel and its shaft, this weight being supported on friction rollers.

As it is necessary that the extremity of the wind shaft must always be placed so as to point to the quarter from which the wind blows, a large vane or weather-cock is placed on the side which is opposite the sails, thus turning them always to the wind. But in large mills the motion is regulated by a small supplementary wind wheel, a pair of sails occupying the place of the vane, and situated at right angles to the principal wind wheel. When the windmill is in its proper position with the shaft parallel to the wind, these supplementary sails do not turn; but when the wind changes they are immediately brought into action, and, by turning a series of wheel work, they gradually bring round the head to its proper position. On account of the inconstant nature of the motion of the wind, it is necessary to make some provision for accommodating the resistance of the sails to the degree of violence with which the wind blows. This is done by clothing and unclothing the sails; that is, by covering with canvas or thin boards a greater or smaller portion of the frame of the sails according to the force of the wind.

WINDOM, WILLIAM, an American financier; born in Belmont, O., May 10, 1827; began practicing law in Mount Vernon, O., in 1850. In 1852 he was made prosecuting attorney of Knox county, O. He held this position for three years, when he removed to Minnesota. He was sent to Congress from that State in 1859, and was re-elected to serve four successive terms, a period of 10 years, ending his career in the House in 1869. He was appointed to the United States Senate in 1870 to fill the unexpired term of Daniel S. Norton, deceased. He was also elected

for the terms ending in 1878 and 1883. He resigned, however, in 1881 to accept the Treasury portfolio in President Garfield's cabinet, and on his retirement from the cabinet after that President's death he returned to the Senate, where he served the remainder of his term. He became Secretary of the Treasury in President Harrison's cabinet in 1889, and died in New York City, Jan. 29, 1891.

WINDOW, an aperture in the wall of a building for the admission of light and air. Modern domestic windows are usually rectangular openings occupied by movable frames filled with glass. The glazed portion or sash is hung or hinged in a frame, the horizontal stone forming the top of the window is the lintel, that at the bottom the sill, the sides of the opening are the jambs, and the portion between the outer face of the wall and the frame is the reveal. Architraves and other moldings commonly appear on the exterior. Venetian windows are large openings divided by piers or columns into three lights, sometimes arched. Windows projecting in a polygonal or semicircular form from the wall are termed bay or oriel windows; they were first introduced in Perpendicular style.

WINDSOR, properly called NEW WINDSOR, a parliamentary borough of Berkshire, England, on the Thames. Windsor and Eton in reality form one town, which is chiefly interesting on account of the antiquity of its castle and park, which have been a favorite residence of English monarchs, especially since the time of William the Conqueror. The older palace of the English kings was the Old Windsor, about 2 miles distant. The buildings may be said to be grouped in three portions: the Middle Ward, containing the Round Tower; the Lower Ward, on the W., containing St. George's Chapel, the houses of the Military Knights, cloisters, etc., and the Upper Ward, on the E., containing the sovereign's private apartments. The unfinished chapel, which was begun by Henry III., was completed by Edward III., rebuilt by Henry VII., and added to by Cardinal Wolsey. Under this chapel is the burial vault of the present royal family. The park and forest adjoining are 13,000 acres in extent. Pop. about 15,000.

WINDWARD ISLANDS, a group in the West Indies, comprising St. Lucia (the largest), St. Vincent, Barbadoes, Grenada, and Tobago.

WINE, a spirituous liquor produced by fermentation from vegetable substances containing saccharine matter. There are a great many vegetable substances from which, by this process, wine may be produced, such as apples, pears, currants, elderberries, and others; but unless otherwise expressed, the term is always used to indicate the fermented juice of the fruit of the common vine.

The history of the vine and its product goes back to the very earliest times of which there is any record, and it may almost be said that its use is coeval with the existence of man. In a very early part of the Mosaic record it is said, "Noah began to be a husbandman, and he planted a vineyard, and he drank of the wine, and was drunken" (Gen. ix: 20); and throughout the whole of the Old Testament narrative, and in the prophetical books, there are frequent references to the use of wine and its effects. In mythological times Bacchus or Dionysos, the son of Zeus and Semele, is known as the god of wine, and the early Greek poets have sung its praises. Homer speaks of wine in its 11th year; Horace commends wine which was of equal age with himself; and Pliny, who devotes to the subject an entire book of his work on natural history, mentions some which he had tasted which was 200 years old. In more modern times the culture of the vine has been a matter of careful study and anxious observation, and so important has become everything connected with its proper growth and propagation and the most advantageous use of its fruit that the published works on the subject are said to number no fewer than 600.

In wine producing countries the cultivation of the vine is as much a branch of national industry as that of wheat or other food producers is in others. The soils which are found to be suitable for its growth are very various in quality, but it thrives best along the borders of rivers or in places where a constant supply of water can easily reach its roots, as along the Rhine valley or in the paludial districts of the Gironde. It is usually propagated, not by seed, which takes five or six years before a seedling begins to bear, but by means of eyes cut from vines and planted in open beds and vineyards, or by planting cut canes which have been obtained from plants of the previous year, and which are usually not interfered with for three years after being put in the ground. The plants are placed in parallel lines, about a yard apart from each other, while the single vines are removed from each other by about the same interval.

When the grapes are ripe they are collected and transformed into wine with no unnecessary delay. White grapes are crushed and pressed, and the juice, freed from stalks and husks, is put into clean

barrels and allowed to ferment in a cellar or other temperate place. Black grapes, which are to yield red wine are crushed, put into vats, juice, husks, and all, and allowed to ferment till the wine is completed, and has extracted the coloring matter. The wine is then drawn off, the murk pressed, and the united products put into barrels. The process of fermentation, on which the peculiar property of the extracted liquor depends, proceeds spontaneously after the grapes have been crushed and the liquor extracted, and its action is to convert the sugar contained in the fruit into alcohol and carbonic acid. Effervescent wines, such as champagne, are bottled, before the fermentation is quite complete, and in that way a portion of the carbonic acid which would otherwise have escaped is forcibly retained and dissolved in the wine. The amount of alcohol contained in the wine varies in different sorts. In the stronger ports and sherries it amounts to from 16 to 25 per cent.; in hock, claret, and other light wines from 7 per cent. The greater part of the wines having more than 13 per cent. of alcohol (*i. e.*, 26 degrees of proof spirit) may be assumed to be brandied or fortified with spirit.

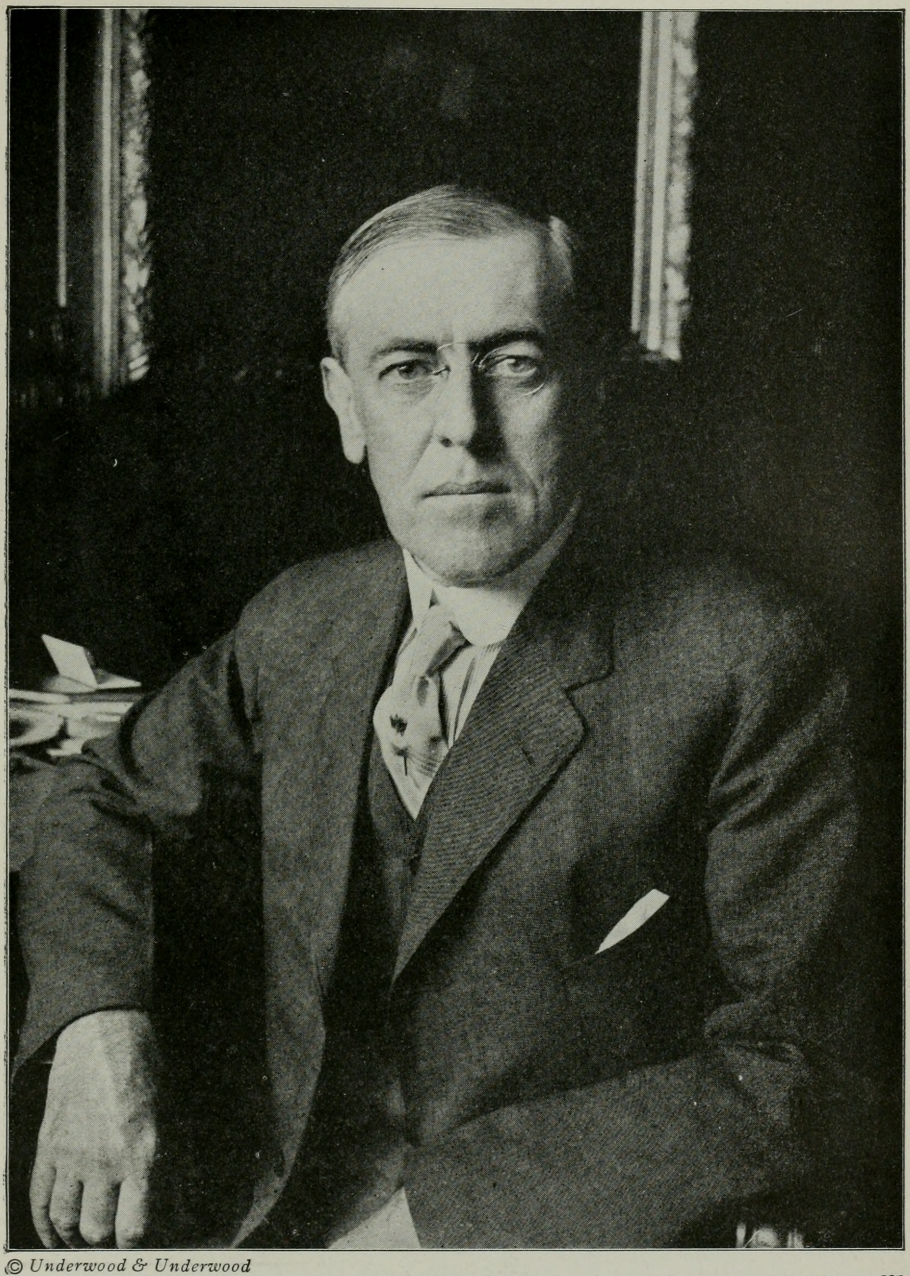
The obscure process of fermentation, by which the sugar of grape juice is changed into alcohol, has been the subject of a vast amount of investigation by many eminent investigators, the last and greatest of whom is Pasteur, who published a most valuable work, "Studies of the Vine" (2d ed. 1873). The change is induced by a minute fungoid organism, *Mycoderma vini*, and chemically it consists in transforming 105.4 parts of grape sugar (glucose) into alcohol 51.1 parts, carbonic acid 49.4, succinic acid 0.7, glycerine 3.2, and yeast matter 1.0. With these there are also developed minute portions of fusel oil and ether, to which is due the aroma or bouquet of the wine. These ethers develop and interact while the wine is maturing, and proper preservation of wine is a matter of the utmost importance. Other changes also occur during ripening. The acid tartrate of potash contained in the juice separates and forms a crust of argol; and frequently, especially with light wines, acid fermentation ensues, and the wine becomes sour. The acid fermentation is caused by a fungus, *Mycoderma aceti*, or by oxidation of alcohol by exposure. Other diseases of wine are due to parasitic and other growths, which have been traced by Pasteur.

WINEBRENNER, JOHN, an American clergyman; born in Frederick co., Md., March 24, 1797; was ordained in the German Reformed Church in 1820; and in the same year was called to the Salem Church in Harrisburg, Pa. He retained his connection with that charge till 1827, when, owing to his religious views on temperance and slavery, he was asked to withdraw; and in 1828 his connection with the Reformed Church ceased by action of the synod. In October, 1830, he established a new denomination under the name of the "Church of God," whose members became known as Winebrennerians. Subsequently he edited the "Gospel Publisher" (afterward the "Church Advocate"); issued "The History of all the Religious Denominations in the United States"; published the "Pronouncing Testament and Gazetteer of the Church of God"; "A Treatise on Regeneration"; "Practical and Doctrinal Sermons"; etc., and compiled the "Church Hymn Book." He died in Harrisburg, Pa., Sept. 12, 1860.

WINES, FREDERICK HOWARD, an American statistician; born in Philadelphia, Pa., April 9, 1838; was graduated at Washington College, Pa., in 1857, and at Princeton Theological Seminary in 1865; was a chaplain in the Union army in 1862-1864; pastor of the First Presbyterian Church, Springfield, Ill., in 1865-1869; became secretary of the Illinois State Board of Commissioners of Public Charities in 1869, and its president in 1893. He was made assistant director of the United States census in 1899. His publications include "Defective, Dependent, and Delinquent Classes in the United States" (10th Census); "Crime, Pauperism, and Benevolence in the United States" (11th Census); "Punishment and Reformation" (1895); "Liquor Problem in Its Legislative Aspects"; etc. He died in 1912.

WINFIELD, a city and county-seat of Cowley co., Kan.; on the Walnut river, and on the Missouri Pacific, the St. Louis and San Francisco, and the Atchison, Topeka, and Santa Fé railroads, 40 miles S. E. of Wichita. It contains Southwest Kansas College (M. E.), St. John's College (Luth.), high school, the Kansas State Institution for the Feeble-minded, waterworks, street railroads, Winfield Chautauqua Assembly occupying Island Park, National banks, and daily, weekly, and monthly periodicals. It has machine shops, flour mills, etc., but the chief industry is farming. Pop. (1910) 6,700; (1920) 7,933.

WING, one of those organs in animals by which flight is effected. In their most typical development, as seen in birds, wings consist of the bones of the fore limbs, specially modified to form a support and axis, while attached to this



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WOODROW WILSON



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THE FIGHT OF THE MARINES IN BELLEAU WOOD. FROM THE PAINTING BY THE FRENCH ARTIST, GEORGES SCOTT

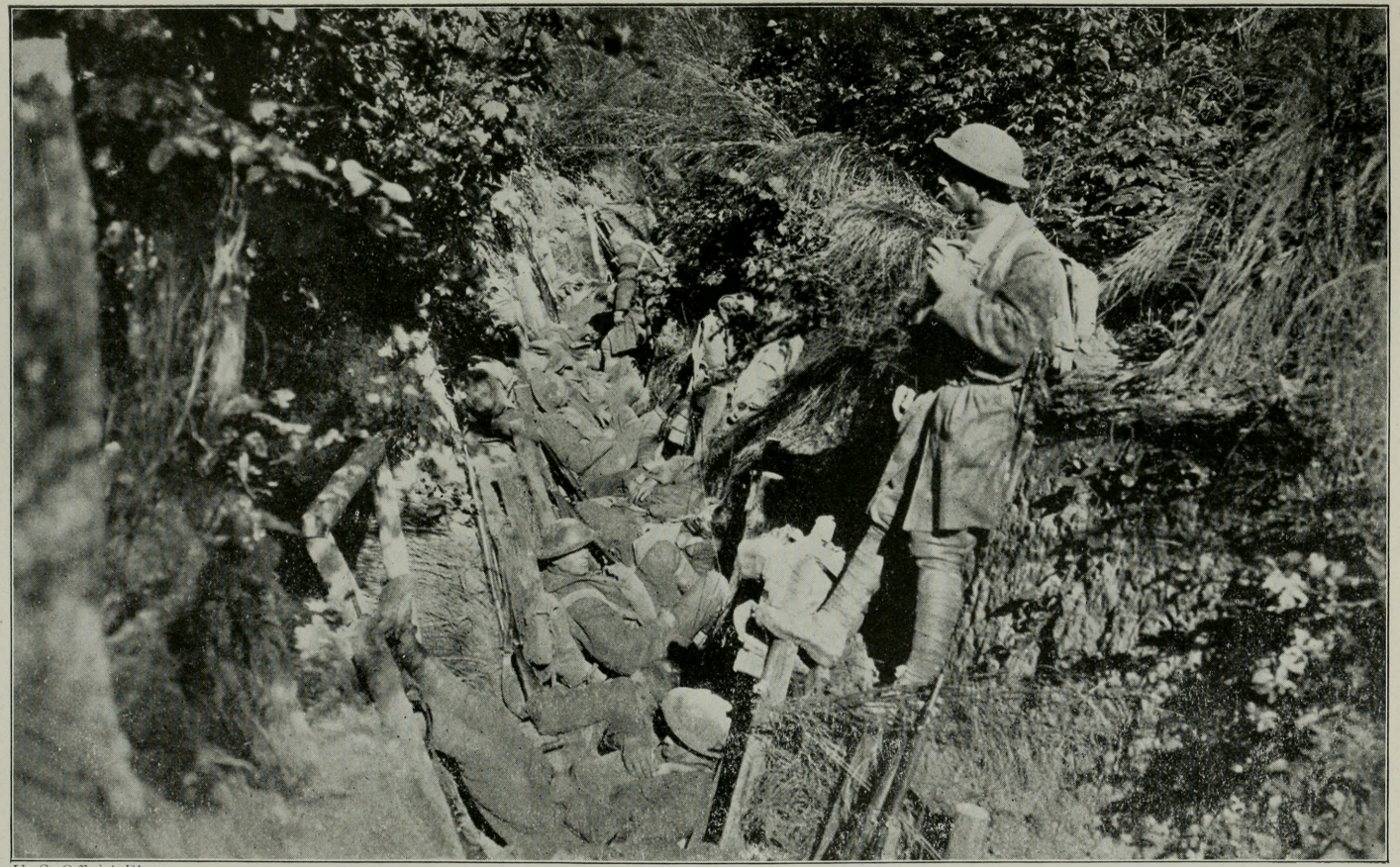


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AMERICAN TROOPS POURING INTO THE ST. MIHIEL SALIENT, TOWARD MONT SEC, ON THE MORNING OF SEPTEMBER 12, 1918



AMERICAN SOLDIERS ON THE WAY TO BREAK THE HINDENBURG LINE, SEPTEMBER 29 1918



U. S. Official Photo

AMERICAN SOLDIERS RESTING IN A SHALLOW TRENCH IN THE ARGONNE FOREST

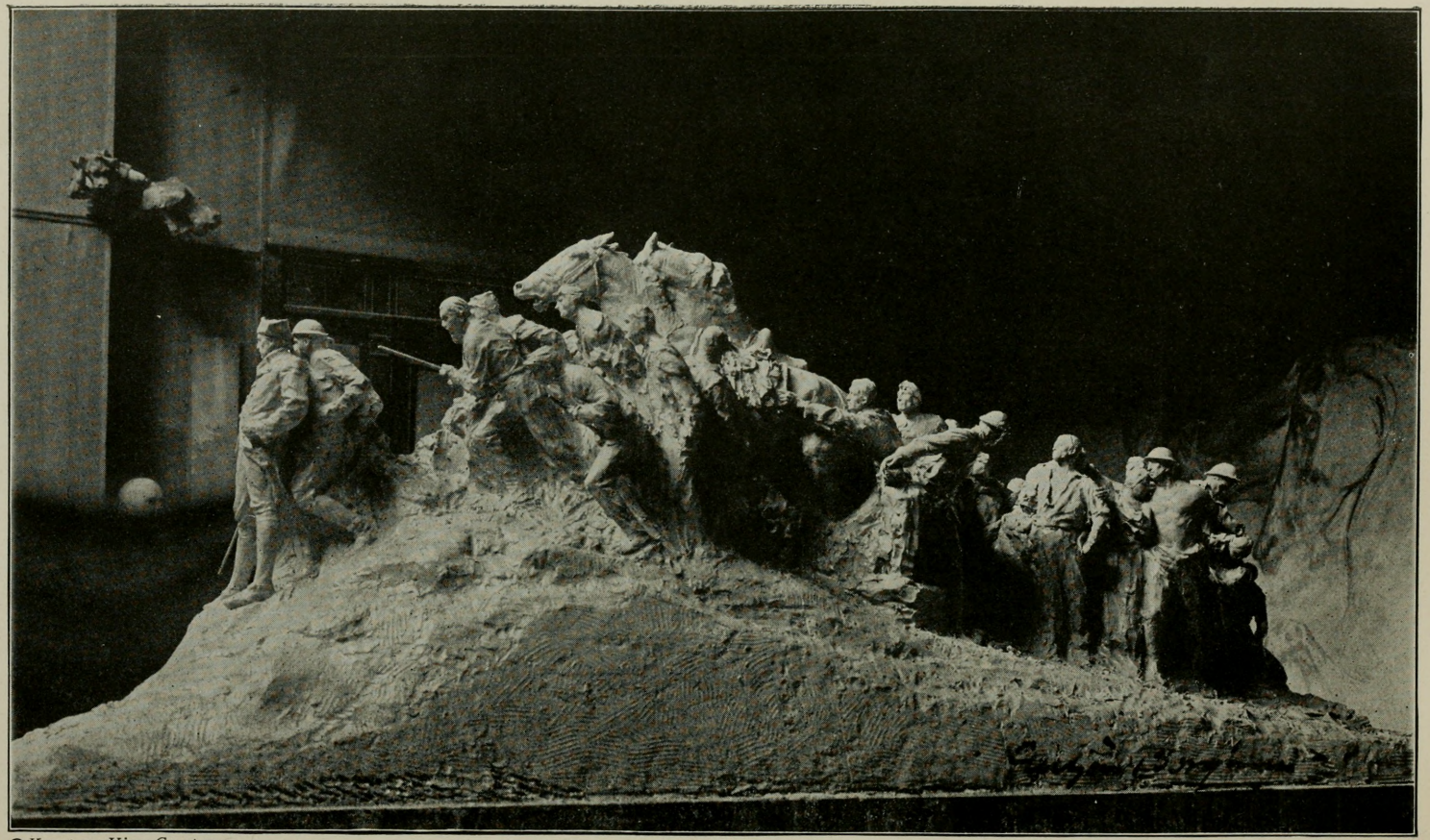


Photo, Wide World Photos

THE SCENE IN THE TRIANON PALACE AT VERSAILLES WHEN PREMIER CLEMENCEAU ANNOUNCED THE TERMS OF THE ALLIES TO THE GERMAN DELEGATES



THE CROWD SURGING AROUND VERSAILLES PALACE, AFTER THE SIGNING OF THE TREATY, JUNE 28, 1919



©Keystone View Company

MODEL FOR "THE WARS OF AMERICA," BY GUTZON BORGLUM—A SOLDIERS' MEMORIAL MONUMENT FOR NEWARK, N. J.

skeleton are the muscles moving the limb. Externally the skin is provided with feathers, and the whole fore limbs of the bird thus form the wings; while the bones of the shoulder girdle are modified to form a special support for the organ of flight. In the bat the wing consists of an expansion of the skin or integument, supported on four of the fingers, which are extremely long. This membrane, or patagium, extends from the fore limbs to the hind limbs, and in many cases between the hind limbs and tail as well. In such mammalia as the flying foxes, flying squirrels, flying phalangers, and in the lizards known as flying dragons, the wing is a mere expansion of skin, extending along the side of the body, often connecting hind and fore limbs, and serving as a parachute to sustain the animals in their flying leaps from tree to tree, but in no sense serving as an organ of true flight. In insects the wing is formed of two delicate skin layers, supported on hollow tubes or *nervures*, placed in communication with the respiratory or breathing system. The wings of insects become thus related to respiration, and by their movements probably aid in the diffusion of air through the breathing tubes.

WINGATE, SIR (FRANCIS) REGINALD, a British general, born at Broadfield, Renfrewshire, in 1861. He was educated at St. James' Collegiate School, Jersey, and of Woolwich. He became a lieutenant in 1880, served in India and Aden 1881-1883, joined the Egyptian army and acted as military secretary to Sir Evelyn Wood during the Nile Expedition. He became colonel in 1899 and major-general in 1903. He was Sirdar of the Egyptian army and Governor-General of the Sudan, 1899 to 1916. He organized numerous expeditions against the Egyptians who sought the overthrow of the British power in their country, and partook in the reconquest of the province of Darfur in 1916. He acted as High Commissioner in Egypt in 1917. He wrote: "Mahdism and the Egyptian Sudan"; "Ten Years' Captivity in the Mahdi's Camp"; and translated Slatin Pasha's "Fire and Sword in the Sudan."

WINNEBAGO, a lake in Wisconsin; in the basin of the Fox river. It is 26 miles long and 10 broad, and has an area of 212 square miles. Both the river and the lake are navigated by steamboats, and afford good fishing.

WINNIPEG, a city and capital of the Province of Manitoba, Canada; at the confluence of the Assiniboine and Red rivers, and on the Canadian Pacific and other railroads; 40 miles S. of Lake Winnipeg, and 1,424 miles by rail W. of Montreal. The city covers an area of about 23 square miles.

Business Interests.—Winnipeg to a large degree is the shipping point for the whole extent of Canadian territory between Lake Superior and the Rocky Mountains. It contains lumber mills, wire plants, foundries, and rolling mills, flour mills, packing establishments, box, carriage and boiler factories, large railway machine and engine shops, etc. The capital invested in its industrial establishments exceeds $75,000,000, and value of goods produced $100,000,000. The bank clearings in 1919 were over $2,300,000,000. There are also many daily, weekly, and monthly periodicals.

Public Interests.—The streets are laid out on the rectangular plan, and there are 31 public parks. The streets are lighted by gas and electricity; water is supplied from the Assiniboine river and numerous artesian wells; and there is an electric street car service. Here are the lieutenant-governor's residence, the legislative buildings, armory, court house, an Anglican cathedral, other churches representing the principal denominations, etc. Besides being the judicial and political metropolis of the Northwest, Winnipeg is also its educational center. It contains the St. John's Ladies' School, St. Mary's Academy, and the University of Manitoba, which comprises St. John's College (Anglican), the College of St. Boniface (R. C.), the Methodist College, the Presbyterian College, and Manitoba Medical College. Here also the Provincial Board of Education holds its sessions. The charitable institutions include the Deaf and Dumb Institute of the Provincial government, St. Boniface Hospital, and Winnipeg General Hospital.

History.—Winnipeg was a trading post of the Hudson's Bay Company prior to 1870, and had a population of about 300. When Manitoba was opened up in 1870 and Winnipeg made its capital people from all parts of Canada were drawn hither. It was incorporated by the Provincial Legislature in 1873, and later its growth received a great impetus by the completion of the Canadian Pacific railroad. Pop. about 200,000.

WINNIPEG, a lake of Canada, in the Province of Manitoba; length, about 250 miles; breadth, from 5 to 70 miles. It receives the surplus waters of Lakes Winnipegoos and Manitoba, besides the Winnipeg river, but its chief tributaries are the Saskatchewan and Red rivers. Its surplus water is discharged by the Nelson river into Hudson Bay. The river of the same name, which flows into Lake Winnipeg, rises in the Lake of the Woods, and has a length of about

250 miles. Its navigation is interrupted by falls.

WINNIPEG RIVER, a river that rises in Minnesota, and flows to Lake Winnipeg. Its course, though serpentine, is generally to the N. It passes through Rainy Lake and the Lake of the Woods, which are thus connected with Lake Winnipeg. Though its length is only 250 miles, it drains a very large basin, and discharges an immense volume of water into Lake Winnipeg.

WINIPISEOGEE LAKE, a lake in New Hampshire. Its length is 25 miles, its breadth varies from 1 to 10 miles; area 175 square miles; elevation above sea-level, 472 feet. It discharges by the Winipiseogee river, an affluent of the Merrimac. It is studded with islands, and abounds in fish. The beautiful scenery of this district attracts many tourists.

WINONA, a city and county-seat of Winona co., Minn.; on the Mississippi river, and on the Winona and Western, the Burlington Route, the Green Bay, Winona and St. Paul, the Chicago, Milwaukee and St. Paul, and the Chicago and Northwestern railroads; 104 miles S. E. of St. Paul. Here are a United States Government building, court house, State Normal School, Winona Seminary, St. Mary's Academy, commercial colleges, library, hospital, street railroad and electric light plants, waterworks, National, State, and savings banks, and several daily and weekly newspapers. A fine railroad bridge crosses the Mississippi river at this point. The city has flour mills, sawmills, foundries, gas works, carriage factories, tannery, barrel factories, and manufactories of sashes and doors, farming implements, etc. Pop. (1910) 18,583; (1920) 19,143.

WINSLOW, EDWARD, a Mayflower emigrant and governor of Plymouth Colony; born in Droitwich, England, Oct. 19, 1595. He was a hostage to Massasoit, his account of which was in George Morton's "Relation" (1622). He was the author of "Good Newes from New England," etc. (1624), printed in full in Young's "Chronicles of the Pilgrim Fathers" (1841); "Brief Narration: or Hypocrisie Unmasked," etc. (1646), reissued as "The Danger of Tolerating Levellers in a Civil State," etc. (1649, printed in part in Young's "Chronicles"); "New England's Salamander," etc. (1647); "The Glorious Progress of the Gospel Amongst the Indians of New England" (1649); and "A Platform of Church Discipline in New England" (1653). He died at sea, between Santo Domingo and Jamaica, May 8, 1655.

WINSLOW, FORBES BENIGNUS, an English alienist; born in London, of a Massachusetts family, in August, 1810; was educated in Scotland and near Manchester, and, after studying medicine at New York and the London University, passed the College of Surgeons (1835), and took his M. D. at Aberdeen. With his earliest practice he combined the duties of a "Times" reporter, but having after 1830 paid special attention to the study of insanity, he opened a private asylum at Hammersmith (later another in London), and rose in time to be the supreme authority on all relating to diseases of the brain. Founder and editor of the "Quarterly Journal of Psychological Medicine and Mental Pathology" (1848) and of the "Medical Critic" (1861), vice-president of the Juridical and president of the Medical Society (1853), president of the Association of Medical Officers of Asylums (1857), and a Commissioner of Lunacy (1859), he was besides a member of numerous scientific bodies, a frequent contributor to the press, and the great "expert" in medico-legal cases. He published "The Application of Phrenology to the Elucidation and Cure of Insanity" (1831); "Anatomy of Suicide" (1840); "Plea of Insanity in Criminal Cases" (1843); "Notes on the Lunacy Act" (1845); "Softening of the Brain" (1849); "Lettsonian Lectures on Insanity" (1854); "Obscure Diseases of the Brain and Disorders of the Mind" (1860; 4th ed. 1868); "Light, Its Influence on Life and Health" (1867); etc. He died in Brighton, England, March 3, 1874.

WINSLOW, JOHN ANCRUM, an American naval officer; born in Wilmington, N. C., Nov. 19, 1811; entered the navy about 1827, became a lieutenant in 1839, and commander in 1855. In 1862 he served under Captain Foote on the Mississippi river. He obtained command of the steamer "Kearsarge," of seven guns, and was ordered to the coast of Europe, to watch Confederate cruisers, in the early part of 1863. On June 19, 1864, he met the "Alabama," Captain Semmes, near Cherbourg. When the vessels were about a mile apart, the "Alabama" began to fire rapidly and wildly, but the guns of the "Kearsarge" were directed with coolness and precision. The vessels fought in circles, swinging steadily around an ever-changing center. After they had described seven circles and had diminished their distance to about a quarter of a mile, the "Alabama" began to sink, and raised a white flag. Captain Winslow lost only three killed and wounded out of 163 officers and men. He took 65 prisoners. He was promoted

commodore in 1865 and rear-admiral in 1870. He died in Boston, Mass., Sept. 29, 1873.

WINSLOW, WILLIAM COPLEY, an American archæologist; born in Boston, Mass., Jan. 13, 1840. He was an Episcopal clergyman; assisted in founding the "University Quarterly," 1861; edited the "Hamilton," 1862; was assistant editor of the New York "World" 1862-1863, and editor of the "Christian Times" 1863-1865; vice-president, secretary, and treasurer for many years of the Egypt exploration fund for the United States; lecturer on archæological subjects and colonial history. He wrote: "Israel in Egypt"; "The Store City of Pithom" (1885); "A Greek City in Egypt" (1887); "The Egyptian Collection in Boston" (1890); "The Pilgrim Fathers in Holland" (1891); "Governor Edward Winslow"; "The Winslow Memorial"; and others.

WINSOR, JUSTIN, an American historian; born in Boston, Mass., Jan. 2, 1831. He was superintendent of the Boston Public Library in 1868-1877, and librarian of Harvard University in 1877-1897. He published: "Bibliography of Original Quartos and Folios of Shakespeare" (1875); "Reader's Handbook of the American Revolution" (1880); "Memorial History of Boston" (edited, 1880-1882); "Narrative and Critical History of America" (edited: 8 vols. 1884-1889); "Christopher Columbus" (1891); "From Cartier to Frontenac" (1894); "The Mississippi Basin"; and "The Struggle in America Between England and France" (1895). He was the highest authority on the early history of North America. He died in Cambridge, Mass., Oct. 22, 1897.

WINSTED, a town of Connecticut, one of the county-seats of Litchfield co. It is on the Mad and Still rivers, and on the New York, New Haven and Hartford and the Central New England railroads. It is an important industrial community and has manufactures of clocks, hosiery, brass goods, tools, machinery, hardware, etc. It has a hospital, several philanthropic institutions, and two libraries. Pop. (1910) 7,754; (1920) 8,248.

WINSTON-SALEM, a city and county-seat of Forsyth co., N. C.; on the Southern, and the Northern and Western railroads; 120 miles W. by N. of Raleigh. The interests of Winston and Salem are nearly identical and they are usually designated as one city, being called Winston-Salem. Here are an academy, numerous churches, National banks, and daily and weekly newspapers. It has cotton and woolen mills, shuttle and bobbin works, an iron foundry, and many large tobacco shops. Pop. (1910) 22,700; (1920) 48,-395.

WINTER, WILLIAM, an American dramatic critic; born in Gloucester, Mass., July 15, 1836. He did journalistic work on the "Saturday Press," "Vanity Fair," the "Albion," "Weekly Review"; and was dramatic critic for the New York "Tribune" till 1909. He wrote "The Convent, and Other Poems" (1854); "The Queen's Domain" (1858), and "My Witness" (1871), poems; "Life of Edwin Booth" (1872); "Thistledown" (1878), poems; "Poems," complete edition (1881); "The Jeffersons" (1881); "English Rambles" (1883); "Life of Henry Irving" (1885); "Shakespeare's England" (1886); "Stage Life of Mary Anderson" (1886); "The Wanderers" (1888); "A Wreath of Laurel"; "The Life and Art of Edwin Booth" (1893); "The Life and Art of Joseph Jefferson" (1894); "Ada Rehan" (1898); "Other Days of the Stage" (1908); "The Life and Art of Richard Mansfield" (1910); "Shakespeare on the Stage" (1911-1915); "Vagrant Memories" (1915); etc. He died in 1917.

WINTERBERGEN, a lofty mountain range in the E. of Cape Colony, forming a part of the great dividing chain, sometimes called "the backbone of south Africa." Its culminating point is the Great Winterberg Peak, 7,806 feet high.

WINTERHOEK MOUNTAINS, a range in Cape Colony whose termination is about 30 miles N. W. of Port Elizabeth. Its loftiest peak, the Cock's Comb, is estimated to be 8,000 feet high, and, though 20 miles inland, is visible 60 miles out at sea. There is also a Winterhoek Peak, 6,840 feet high, 75 miles N. E. of Cape Town, whence it is visible.

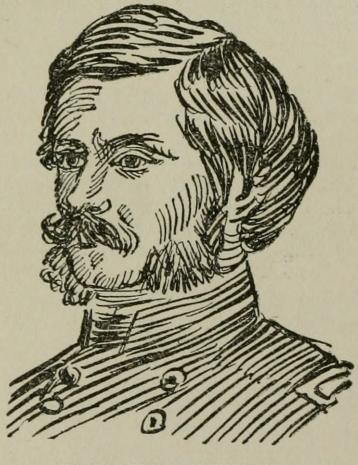
WINTHROP, a town of Massachusetts which includes several villages, in Suffolk co., on Massachusetts Bay, and on the Boston, Revere Beach and Lynn railroad. It is a residential suburb of Boston. Pop. (1910) 10,132; (1920) 15,455.

WINTHROP, JOHN, first governor of Massachusetts; born in Groton, England, Jan. 12, 1588. He came with the first colonists to Salem in 1630 as their governor, and remained in that office, with the exception of six or seven years, till his death. He left a journal of the proceedings of the colony, which has been published, and is a valuable contribution to the early history of Massachusetts. He died in Boston, March 26, 1649. His son, JOHN, born in Suffolk, England, Feb. 12, 1606, arrived in Massachusetts in 1633. On returning to

England he collected a body of colonists and settled with them in Saybrook, Conn., and was appointed their governor, retaining the office till his death. He was devoted to scientific pursuits, and had the honor of being one of the founders of the Royal Society of London. He died in Boston, April 5, 1676.

WINTHROP, ROBERT CHARLES, American statesman; born in Boston, Mass., May 12, 1809; was graduated at Harvard College in 1828; studied law with Daniel Webster, and was admitted to the bar in 1831. He soon left law for politics and in 1834 was elected to the State Legislature, where he served five years, three as Speaker of the House. In 1840 he was elected to Congress, serving for 10 years, two years as speaker. He was appointed Webster's successor in the United States Senate in 1850, and served one year, after which he retired from public life. He died in Boston, Mass., Nov. 16, 1894.

WINTHROP, THEODORE, an American military officer; born in New Haven, Conn., Sept. 22, 1828; was graduated at Yale College in 1848; traveled extensively; studied law, and joined the 7th New York Regiment in 1861. The 1861 "Atlantic Monthly" contained sketches

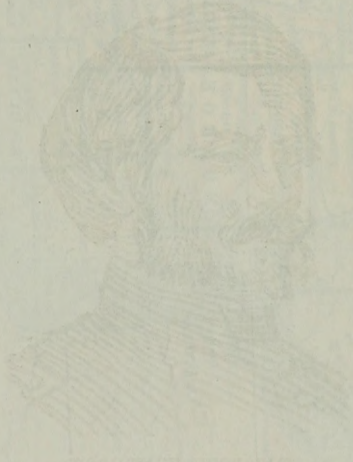


THEODORE WINTHROP

from him of early war scenes. He left completed material for five volumes of novels and essays: "Cecil Dreeme" (1861); "John Brent" (1862); "Edwin Brothercroft" (1862); "The Canoe and the Saddle" (1862); and "Life in the Open Air, and Other Papers" (1863). His sister published "Life and Poems of Theodore Winthrop" (1884). He was killed at the head of an assaulting column of Northern troops at Big Bethel, Va., June 10, 1861.

WIRE, a metallic rod, thread, or filament of small and uniform diameter. The largest size, numbered 0000, of the Birmingham wire-gauge, has a diameter of .454 inch; but smaller sizes even than this, except when drawn out to considerable lengths, are generally known as bars or rods. Lead wire for the manufacture of bullets may considerably exceed the above diameter. Wire is usually cylindrical, but it is also made of various other forms, as oval, half-round, square, and triangular, and of more complicated shapes for small pinions; for forming the pattern on blocks used in calico-printing, and for other purposes. Used absolutely for telegraph wire, and hence, colloquially, applied to the telegraph itself; as, to send a message by wire. Used in hunting language for wire-fencing. Wire of Lapland is a shining slender substance made from the sinews of the reindeer, soaked in water, beaten and spun into thread. Being then coated with tin, it is used by the Laplanders to embroider their clothes.

WIRELESS TELEGRAPHY AND TELEPHONY. A system of wireless telegraphy has been developed through three different methods, which may be classified as conduction, induction, and wave methods. By the method of conduction, currents are sent through the earth from one electrode to another, at the sending station. By the induction method, use is made of a property passed by alternating currents, of exciting similar currents in neighboring conductors with the aim of obtaining as intense a current as possible in the secondary circuit. The two methods were combined by W. H. Preece, of England. The third method is by the use of electromagnetic waves. This was introduced and developed by William Marconi, to whom is generally ascribed the invention of wireless telegraphy. After experiments were carried on through many years, practical use of wireless telegraphy was first demonstrated in the rescue of the steamship "Republic", in 1909, and of the survivors of the steamship "Titanic", in 1912. Both of these vessels were equipped with wireless telegraphy by which notification of disasters was given. Within a short period, all trans-Atlantic steamers and naval vessels were fitted with wireless telegraph apparatus, and wireless stations were erected in many parts of the United States, the British Isles, continental Europe, and other parts of the world. Service between the Eiffel Tower, Paris, and the United States was put into effect in 1911, and in 1913 wireless communication





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was established between Sayville, L. I., and Nauen, Germany. Direct communication by wireless telegraphy was established between the United States and Japan in 1915. During the World War practically all war vessels, including submarines, were equipped with wireless apparatus. Aeroplanes were likewise equipped with wireless installations and these proved an effective means of locating enemy troops and batteries. Wireless telegraphy was developed to a high state of efficiency during the war. It is also used for commercial purposes and in the transmission of news and commercial matter. The United States has established a widespread system of aerial communication. Stations are established at Arlington, Va., Panama Canal Zone, San Francisco, Pearl Harbor, Hawaii, in Samoa, and in the Philippine Islands.

Wireless Telephony. — A system of telephone communication in which the action of the transmitter brings about fluctuations in electric waves which are radiated through space by a high frequency current. These fluctuations are reproduced at the distant station in the form of the original sounds. Wireless telephony differs from wireless telegraphy in that the transmission of waves is continuous instead of interrupted. Wireless telephony has become a practical method of communication between ships at sea and between moving railroad trains. The distance to which sounds can be transmitted is practically limitless. Communication is held between New York and San Francisco, and between Arlington, Va., and Honolulu. The system was developed to a point of great efficiency in aeroplanes during the war. This use was especially notable in the great Meuse-Argonne campaign of 1918, when the American Signal Corps successfully directed operations beyond the lines by the use of wireless telephony.

WIRT, WILLIAM, an American lawyer; born in Bladensburg, Md., Nov. 8, 1772; was admitted to the bar in 1792, and in 1806 settled in Richmond, Va., where he became a prominent lawyer. He distinguished himself at the trial of Aaron Burr in 1807, as one of the counsel for the prosecution. He held many State offices, being clerk of the House of Delegates, Chancellor of the Eastern Shore of Virginia, and member of the House of Delegates. He was appointed United States District Attorney in 1816, and Attorney-General in 1817, holding the latter office till 1829, through three administrations. He was nominated for President in 1832 by the Anti-Masonic party and received the electoral vote of Vermont. He wrote "Letters of the British Spy" (1803); "The Rainbow" and other essays; "Sketches of the Life and Character of Patrick Henry" (1817), and various addresses. He died in Washington, D. C., Feb. 18, 1834.

WISBY, the chief town of the Swedish island of Gotland; is a thriving seaport on the W. coast, and has a fine cathedral (1200). It was once one of the richest of the Hanse towns, with 18 churches, but was taken and destroyed by the Danish King Valdemar III. in 1361, and has never regained its importance. There are great ruins of seven of its former churches; but of the others and of the castle of Wisborg, destroyed by the Danes in 1675, there is little trace left. Pop. about 10,000.

WISCONSIN, a State in the North Central Division of the North American Union; bounded by Lakes Michigan and Superior, Michigan, Illinois, Iowa, and Minnesota; admitted to the Union, May 20, 1848; capital, Madison; number of counties, 71; area, 56,066 square miles; pop. (1890) 1,686,880; (1900) 2,069,042; (1910) 2,333,860; (1920) 2,632,067.

Topography.—Wisconsin is an elevated undulating plain with an altitude of from 600 to 1,800 feet above the sea. A ridge about 30 miles S. of Lake Superior forms the watershed of the State, the ground sloping down in all directions. A high cliff extends along the shore of Green Bay and Lake Winnebago. The Mississippi river extends along the W. boundary for a distance of 250 miles, and receives the St. Croix, Chippewa, Black, and Wisconsin rivers. Other important rivers are the Rock, St. Louis, Bois Brulé, Bad, and Montreal, flowing into Lake Superior; the Menomonee, Peshtigo, Oconto, Pensaukee, and Fox, flowing into Green Bay; and the Manitowoc, Sheboygan, and Milwaukee, emptying into Lake Michigan. The State is famous for its numerous beautiful lakes among which are the Winnebago, St. Croix, Pepin, Poygan, Pewaukee, Geneva, Green, Koshkonong, Oconomowoc, and Four Lakes. The lake shores have numerous excellent harbors, including Green Bay, Chequamegon Bay, and Port Washington.

Geology and Mineralogy.—The Laurentian, Devonian, and Archæan periods are all well represented in Wisconsin. The Archæan rocks cover an area in the N. central portion of the State, with an extreme length of 240 miles, and 160 miles wide. They consist principally of metamorphic granite, gneiss, syenite, diorite, schists, and slates. S. of this tract, and along the Lake Superior slope are

beds of Silurian origin. The mineral resources of the State are very extensive. Lead, copper, iron, and zinc occur abundantly and are mined with profit. The production of zinc is about 50,000 tons annually, valued at over $10,000,000. The iron production in 1919, almost entirely from the Lake Superior district, was 52,003,000 tons, compared with 59,779,794 tons in 1918. The iron produced is entirely hematite. The production of pig iron in 1918 was 363,225 tons, valued at $13,832,908. The State is an important producer of stone and mineral waters.

Agriculture.—Much of the N. part of the State is covered with extensive forests of white pine, balsam, hemlock, and other cone-bearing evergreens. The soil in the N. is not well adapted to agriculture, but the prairies in the S. and central portions are exceedingly rich and productive, raising the cereals, tobacco, and potatoes in great quantities. The acreage, production, and value of the principal crops in 1919 was as follows: Corn, 1,820,000 acres, production 85,540,000 bushels, value $106,925,000; oats, 2,339,000 acres, production 78,123,000 bushels, value $54,686,000; wheat, 549,000 acres, production 7,355,000 bushels, value, $15,814,000; rye, 525,000 acres, production 8,295,000 bushels, value $11,033,000; barley, 512,000 acres, production 13,568,000 bushels, value $16,417,000; tobacco, 48,000 acres, production 60,960,000 pounds, value $13,533,000; hay, 2,677,000 acres, production 4,738,000 tons, value $96,181,000; potatoes, 300,000 acres, production 28,200,000 bushels, value $39,480,000.

Manufactures.—There were in 1914 9,104 manufacturing establishments, employing 194,310 wage earners. The capital invested was $754,287,000; wages paid $112,193,000; value of the materials used $417,415,000; and the value of the finished product $695,172,000.

Banking.—On Oct. 31, 1919, there were reported 147 National banks in operation, having $22,120,000 in capital; $12,711,000 in outstanding circulation; and $53,362,000 in United States bonds. There were also 775 State banks with $24,558,000 capital, and $8,791,000 surplus. The exchanges at the United States clearing house at Milwaukee during the year ending Sept. 30, 1919, aggregated $1,539,000,000, an increase over those of the preceding year of $104,917,000.

Education.—Education is compulsory for all children between the ages of 7 and 14; in the cities for the entire school year and in towns and villages, for six months. There were in 1919 405,467 pupils enrolled in the elementary schools, with 14,475 teachers. There were 373 high schools, with 51,388 pupils. The State has nine normal schools, with about 4,000 students. The universities for higher education include the University of Wisconsin, at Madison; Beloit College, at Beloit; Marquette College and Concordia College, at Milwaukee; Lawrence University, at Appleton; and the Milwaukee Downer College for Women, at Milwaukee.

Finances.—The receipts for the fiscal year 1918-1919 amounted to $26,582,892, and the disbursements to $24,094,807. There was a balance at the end of the year amounting to $7,558,647. The assessed valuation of all property on September 30, 1919, was $4,068,268,534. The bonded indebtedness of the State in 1919 was $1,851,000.

Churches.—The strongest denominations in the State are the Roman Catholic; Lutheran, Independent Synods; Methodist Episcopal; Congregational; Regular Baptist; Evangelical Association; German Evangelical Synod, and Presbyterian.

Railways.—The total railway mileage in 1919 was 7,736.18 miles. The roads having the longest mileage are the Chicago and Northwestern, the Chicago, Milwaukee and St. Paul and the Minneapolis, St. Paul and Sault Ste. Marie railroads.

State Government.—The governor is elected for a term of two years. Legislative sessions are held biennially in odd years, beginning on the second Wednesday in January, and there is no limit to length of session. The Legislature has 33 members in the Senate and 100 in the House. There are 11 representatives in Congress.

History.—The region W. of Lake Michigan was first explored and occupied by French missionaries and traders in 1639, and the country was held thenceforward under French dominion till its surrender to Great Britain in 1763. Canadian law governed the territory, and the English kept possession with a military force at Green Bay till 1796, when it reverted to the Americans, who included it within the extended limits of their government of the Northwest Territories. In 1809 Wisconsin was annexed to the Territory of Illinois, as then formed, and so continued till the conversion of the latter into a State in 1818, when Wisconsin, which was yet a wilderness, was annexed to Michigan Territory, for such government as was needed. In 1827, lead was discovered in large quantities at Potosi and Mineral Point, and there was a great rush of immigrants to that section. The Indians soon became troublesome, and the Black Hawk War ensued in 1832. Treaties were made with

the Indians soon after, by which they removed to reservations beyond the Mississippi. In 1836, the population had increased to such an extent that a Territorial government was organized, which at first included a part of the upper peninsula of Michigan, the whole of Minnesota and Iowa, and that part of the Dakotas lying E. of the Missouri and White Earth rivers. On the admission of Michigan into the Union as a State, a part of the Lake Superior region was set off to her, and when the Territory of Iowa was formed, it included all the region W. of the Mississippi. The first effort to procure the admission of Wisconsin to the Union as a State was made in 1846. A constitution drafted during that year was ratified in March, 1848, and the State was admitted to the Union by Act of Congress, May 29, 1848. Under this constitution, with some amendments, it is still governed.

WISCONSIN RIVER, the largest river in Wisconsin. It rises in Lake Vieux Desert, in the N. part of the State, and flows S. and W., emptying into the Mississippi 4 miles below Prairie du Chien. It is nearly 600 miles long and is navigable to Portage City. Remarkable rapids and falls, called "dalles," occur at several places, the river passing through deep gorges between rocky bluffs, some of which are more than 400 feet high.

WISCONSIN, UNIVERSITY OF, a coeducational non-sectarian institution in Madison, Wis.; founded in 1848; reported at the close of 1919: Professors and instructors, 682; students, 5,274; president, E. A. Birge.

WISDOM OF SOLOMON, THE, the title of an apocryphal book, named in Greek *Sophia Salomon*, or *Salomontos*, generally placed sixth in order between "the rest of Esther" and Ecclesiasticus.

WISE, HENRY ALEXANDER, an American statesman; born in Drummondtown, Va., Dec. 3, 1806; was educated at Washington College, Pa.; admitted to the bar in 1828; member of Congress in 1833-1843; minister to Brazil, under President Tyler, in 1844-1847; and Democratic governor of Virginia in 1856-1860. He opposed secession, but in 1861 joined the Confederate army as Brigadier-General. He was defeated in the Kanawha valley in 1861, and at Roanoke Island in 1862. After the war he resumed the practice of law in Richmond, Va., and died there Sept. 12, 1876.

WISE, HENRY AUGUSTUS, an American naval officer; born in Brooklyn, N. Y., May 12, 1819; entered the navy as midshipman in 1834, and rose to chief of the bureau of ordnance in 1866. Under the pseudonym of "Harry Gringo," he wrote "Los Gringos; or, An Interior View of Mexico and California, with Wanderings in Peru, Chili, and Polynesia" (1849); "Tales for the Marines" (1855); "Scampavias, from Gibel-Tasek to Stamboul" (1857); "The Story of the Gray African Parrot" (1856), a book for children; and "Captain Brand of the Centipede" (1860). He died in Naples, Italy, April 2, 1869.

WISE, ISAAC MAYER, a Jewish rabbi; born in Bohemia, April 3, 1819; settled in New York City in 1846. He resided in Cincinnati, O., after 1854, and became president of the Hebrew Union College. He was a leader of the reform movement in American Judaism; and besides editing the "Israelite," a weekly journal, he wrote extensively. Among his works are: "History of the Israelitish Nation" (1854); "Essence of Judaism" (1860); "Judaism: Its Doctrines and Duties" (1862); "The Martyrdom of Jesus of Nazareth" (1874); "The Cosmic God" (1876); "History of the Hebrews' Second Commonwealth" (1880); "Judaism and Christianity" (1883); "Pronaos to Holy Writ" (1891); etc. He died in 1900.

WISEMAN, NICHOLAS PATRICK, an English prelate; born in Seville, Spain, Aug. 3, 1802; was educated at Waterford and the Roman Catholic College, Ushaw, near Durham; joined the English College then newly formed (1818) at Rome; became Professor of Oriental Languages and (1828) rector of the English College; returned to England (1835), and was appointed successively rector of Ushaw, vicar apostolic of the central district of England, and Roman Catholic Archbishop of Westminster and cardinal (1850). He was the author of "Lectures on the Connection Between Science and Revealed Religion" (1836), "Letters on Catholic Unity" (1842); "Papal Supremacy" (1850); "Fabiola" (1854); "Four Last Popes" (1858); and joint-editor for many years of the Dublin "Review." He died in London, England, Feb. 15, 1865.

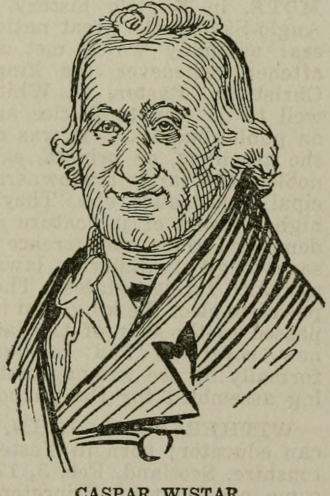
WISE MEN OF THE EAST, the three Magi who followed the guiding star to Bethlehem. They are the patron saints of travelers.

WISMAR the second seaport of Mecklenburg-Schwerin, Germany; on the Baltic, at the head of a bay of the same name; 20 miles N. of Schwerin. It has an excellent harbor, carries on an active over-sea trade, and has varied manufactures. Of the walls only four gates

remain; but the numerous quaint old houses are a feature of the place, and several of the brick churches, as well as the Fürstenhof, once a ducal residence, date from the 14th and 15th centuries. It was a Hanse town in the 13th century, passed to Sweden in 1649, was taken by the Danes in 1675, and by the Danes, Prussians, and Hanoverians in 1712, when its strong fortifications were destroyed, and in 1803 was pawned to Mecklenburg-Schwerin, which secured it finally in 1828. Pop. about 25,000.

WISSEMBOURG, a French town, close to the frontier of the Bavarian palatinate; until 1919 a town in the German district of Lower Alsace; on the Lauter, 42 miles N. N. E. of Strassburg. It grew up round a 7th-century Benedictine abbey, and in 1677-1697 was ceded to France. Here was fought, on Aug. 4, 1870, the first great battle of the Franco-Prussian War, in which the Germans were victorious. The Lines of Wissembourg, originally made by Villars in 1706, are famous—a line of works extending to Lauterburg 9 miles S. E. Like the fortifications of the town, those of the lines have now disappeared. Pop. about 7,500.

WISTAR, CASPAR, an American physician; born in Philadelphia, Pa. Sept. 13, 1761; received a classical education; was graduated at the Medical



CASPAR WISTAR

Department of the University of Pennsylvania in 1782; spent several years in England and Scotland; and returning to the United States in 1787 he began practice in his native city. He was Professor of Chemistry and Physiology at the College of Philadelphia in 1789-1792. In the latter year that institution was united with the Medical Department of the University of Pennsylvania, and he was there Adjunct Professor of Anatomy, Midwifery, and Surgery in 1792-1808; then became Professor of Anatomy and held the chair till his death. He was the first to show that the posterior portion of the ethmoid bone was attached to the triangular bones. He opened his house once a week for meetings of students, travelers, scientists, and citizens. These symposiums were long continued after Dr. Wistar's death, being known as the Wistar parties. Dr. Wistar became a member of the American Philosophical Society in 1787, and succeeded Thomas Jefferson as president in 1815. He was the author of "A System of Anatomy, for the Use of Students of Medicine." He died in Philadelphia, Pa., Jan. 22, 1818.

WISTARIA, a genus of plants of the natural order *Leguminosæ;* sub-order *Papilionaceæ*, having pinnate leaves and flowers in terminal racemes, the pod leathery. The species were formerly included in the genus *Glycine.* Some of them are among the most magnificent ornamental climbers known in British gardens. *W. frutescens*, a native of Virginia, Illinois, and other parts of North America of similar climate, found chiefly in marshy grounds, attains the height of 30 feet, and has beautiful racemes of fragrant bluish-purple flowers. *W. chinensis* or *consequana*, a native of China, has larger flowers in pendulous racemes, and its branches run to the length even of 90 feet. These plants are generally trained on walls.

WISTER, OWEN, an American writer, born in Philadelphia, in 1860. He graduated from Harvard University in 1882. He studied law and was admitted to the bar in 1889, but in 1891 engaged in literary work. His novels of the West, especially "The Virginian," presented remarkable pictures of the early days of the development of the far West. His published works include: "Red Men and White" (1896); "Lin McLean" (1898); "Lady Baltimore" (1906); "Mother" (1907); "Members of the Family" (1911); "The Pentecost of Calamity" (1915). He also wrote a biography of General Grant. He was a member of several literary societies and was a fellow of the American Academy of Arts and Sciences, and a member of the Board of Overseers of Harvard University.

WITCHCRAFT, the practices of witches; a supernatural power which persons were formerly supposed to ob-

tain by entering into a compact with the devil. The compact was sometimes express, whether oral or written, when the witch abjured God and Christ, and dedicated herself wholly to the evil one; or only implied, when she actually engaged in the service, practiced infernal arts, and renounced the sacraments of the Church. The express compact was sometimes solemnly confirmed at a general meeting, at which the devil presided, and sometimes privately made by the witch signing the articles of agreement with her own blood, or by the devil writing her name in his "black book." The contract was sometimes of indefinite duration, at other times for a certain number of years. The witch was bound to be obedient to the devil in everything, while the other party to the act delivered to the witch an imp, or familiar spirit, to be ready at call and to do whatever was directed. He further engaged that they should want for nothing, and be able to assume whatever shape they pleased to visit and torment their enemies and accomplish their infernal ends. The belief in witchcraft is of great antiquity. The punishment for witchcraft was death, generally by burning. The number of people put to death in England has been estimated at about 30,000. Statutes were passed against witchcraft in the reigns of Henry VI., Henry VII. (1541), Elizabeth (1563), and James I. (1604). During the sitting of the Long Parliament 3,000 persons are said to have been executed on the charge of witchcraft. Judicial convictions were checked chiefly by the firmness of Judge Holt, who in about 10 trials, from 1694 to 1701, charged the juries in such a manner as to cause them to bring in verdicts of acquittal.

The first law against witchcraft in Scotland was passed in 1563. The last victims in England were Mrs. Hickes and her daughter, nine years of age, executed in 1716, and the last in Scotland suffered in 1722. Prosecution for witchcraft was abolished both in England and in Scotland by 9 George II. (1736), which made all persons pretending to use the name punishable by imprisonment. By a subsequent act passed in the reign of George IV., they were made punishable as rogues and vagabonds. Witchcraft was first practiced in America in 1692 at Salem, Mass. It broke out in the family of Mr. Parish, a minister. A company of girls had been in the habit of meeting a West Indian slave to study "black art." They suddenly began to act mysteriously, bark like dogs, and scream at something unseen. An old Indian servant was accused of bewitching them. The excitement spread and impeachments multiplied. A special court was formed to try the accused, and as a result the jails rapidly filled, and many were condemned to death. It was unsafe to express a doubt of a prisoner's guilt. Fifty-five persons suffered torture, and 20 were executed. Witches were supposed to be able, with the assistance of the devil, not only to foretell events, but to produce mice and vermin, to deprive men and animals, by touching them or merely breathing on them, of their natural powers, and to afflict them with diseases, to raise storms, etc., to change themselves into cats and other beasts, etc. General assemblies of witches, called "Witches' Sabbaths," were held yearly, or oftener, at which they appeared entirely naked, and besmeared with an ointment made from the bodies of unbaptized infants. To these meetings they were supposed to ride from great distances on broomsticks, pokers, goats, hogs, or dogs, the devil taking the chair under the form of a goat. Here they did homage to their master, and offered him sacrifices of young children, etc., and practiced all sorts of license till cock-crowing. Neophytes were introduced to the devil at these meetings, and received his mark on their bodies, in token that they had sold their souls to him. See DEMONOLOGY: DEVIL.

WITENAGEMOT, or **WITENAGEMOTE**, in English history, among the Anglo-Saxons the great national or general assembly which met annually or oftener, whenever the king kept his Christmas, Easter, or Whitsuntide, as well to do private justice as to consult on public business. It was composed of the athelings, or princes, ealdormen, or nobles, the large landowners, the principal ecclesiastics, etc. They formed the highest court of judicature in the kingdom, and their concurrence was necessary to give validity to laws, and treaties with foreign states. They had even power to elect the king, and if the throne passed to the heir of the late king, the new sovereign had to be recognized formally by the witenagemot at a meeting assembled for the purpose.

WITHERSPOON, JOHN, an American educator; born in Yester, Haddingtonshire, Scotland, Feb. 5, 1722. He became president of Princeton College in 1768; delegate for six years from New Jersey to the Continental Congress, and a signer of the Declaration of Independence. He wrote; "Ecclesiastical Characteristics" (1753); "Nature and Effects of the Stage" (1757); "Essays on Important Subjects" (1764); "Considera-

tions on the Nature and Extent of the Legislative Authority of the British Parliament" (1774); etc. ("Works," 9 vols. Edinburgh, 1804). He died near Princeton, N. J., Sept. 15, 1794.

WITTE, SERGEI YULIEVITCH, COUNT, a Russian statesman; born at Tiflis, in 1849. He was educated at the University of Odessa and for a time was engaged in journalism. He soon entered the government service, however, and during the Russo-Turkish War did distinguished service in the transportation of troops. He was a member of the Imperial Railway Commission, and in 1883 published "Principles of Railway Tariffs." In 1892 he was appointed Minister of Communications, and soon afterward became Minister of Finance. He brought about many reforms in industrial development and introduced the gold standard. His efforts were especially directed toward the completion of the Trans-Siberian railway. In 1903 he was appointed president of the Committee of Ministers. He was appointed senior Russian delegate to negotiate peace with Japan, and at the Portsmouth Conference succeeded in obtaining favorable terms for Russia. He was created Count on his return, and became a powerful figure in the government during the Liberal upheaval which followed the Russo-Japanese War. He succeeded in obtaining from the Czar the manifesto of Aug. 30, 1905, and was appointed the first Russian Prime Minister. He was bitterly opposed by the Conservative circles and resigned office in 1906. He spent much time abroad and took no further part in governmental activities. He died in 1915.

WITTEKIND, or WIDUKIND, the leader of the Saxons in their struggle with Karl the Great; came of a noble Westphalian house, and first appears at the head of the Saxon expedition against the Westphalian fortress of Eresburg (774). The emperor's return from conquering the Lombards drove him across the Weser, and after vainly renewing the revolt in 776, he fled to Denmark, but returning during Karl's absence in Spain, laid waste the Rhineland and surprised and annihilated the Frankish army on the Süntelgebirge (782). Karl retaliated by executing 4,500 Saxon prisoners, an action that roused the entire Saxon race to arms. The battle of Detmold was drawn (783), but that of Osnabrück crushed Wittekind's hopes and forced him to enter on negotiations, whose issue was that in 785 he accepted baptism in the imperial camp at Attigny, in Champagne. Karl, it is said, made him Duke of the Saxons and lord of Engern, and from his castle of Babilonie, near Lübeck, he exercised a mild and righteous sway till 807, when he fell in battle with Gerold, the Swabian duke. Various princely houses, as those of Brunswick and Sardinia, claim Wittekind for the founder of their line.

WITTENBERG, a town in Prussia; province of Saxony; on the Elbe, 45 miles S. E. of Madgeburg. It was while Luther was a professor in Wittenberg that he nailed his 95 theses to the door of the Schlosskirche. The university in which he was professor was united to Halle in 1817. The principal buildings are the Schlosskirche, in which both Luther and Melanchthon are buried; the Stadtkirche, where Luther and Melanchthon preached; the remains of the Augustine monastery, with Luther's apartments; the houses of Melanchthon and Cranach; the town hall, the gymnasium, etc. Pop. about 25,000.

WITTENBERG COLLEGE, a coeducational institution in Springfield, O., founded in 1845 under the auspices of the Lutheran Church; reported at the close of 1919: Professors and instructors, 32; students, 1,050. President, C. G. Heckert, D. D.

WITWATERSRAND (Anglicized WHITE WATER RANGE), the name of a height of land in the Transvaal, south Africa, running S. and S. W. of Pretoria, and located between the Klip and Vaal rivers on the S. and the Limpopo on the W. It is about 100 miles long and extends nearly E. and W. with lat. 26° S. In 1886 gold was first discovered here, and since that date the region has developed into one of the most famous gold mining districts in the world. The production of gold in 1919 was valued at £35,384,000. See TRANSVAAL.

WOBURN, a city in Middlesex co., Mass.; on the Boston and Maine railroad; 10 miles N. W. of Boston. It contains a public library, high school, Warren Academy, the birthplace of Benjamin Thompson (Count Rumford) preserved by an association, numerous churches, waterworks, electric street railroads, electric lights, National and State banks, and several newspapers. It has the largest leather industry in New England, and manufactories of shoes, chemicals, glue, electric dynamos and lamps, etc. Pop. (1910) 15,308; (1920) 16,574.

WODEN, or ODIN, the principal deity of the German and Scandinavian mythologies, common to all Teutonic peoples, and in a measure, corresponding to the Zeus of the Greeks. Odin, while not the

creator, is the ruler of heaven and earth, an omniscient being, the king of the deities. His celestial residence is the palace Heidskialf, in Asgard, from whence his two black ravens, Hugin (Thought) and Munin (Memory), are sent forth daily to gather and bring in tidings of all that is taking place in earth and heaven. He is also the god of war, holding his court in Valhalla, whither brave warriors pass after death to revel in joys of battle and the hunt, such as they loved best on earth. Odin became the wisest of the gods by the aid of a draught from Mimir's fountain, though in doing so he lost the sight of one eye. Like Zeus, he added to his queen, Frigga, various other wives and favorites, and had a numerous progeny of sons and daughters. According to Rhys, Odin, or Woden, the sky god of the Teutons, may have had a Celtic origin, and been synonymous with the Celtic Gwydion.

WODROW, ROBERT, a Scotch clergyman; born in Glasgow, Scotland, in 1679; was educated at Glasgow University, and became minister of the parish of Eastwood, Renfrewshire, in 1703, where he remained all his life. He published "The History of the Sufferings of the Church of Scotland from the Restoration to the Revolution" (1721); and wrote a series of Scotch ecclesiastical biographies, the MSS. of which are preserved in Glasgow University. From these there has been edited for the Maitland Club, by Rev. Dr. Leishman, "Lives of the Reformers and most Eminent Ministers of the Church of Scotland" (1834-1845). He has also edited Wodrow's "Analecta, or Materials for a History of Remarkable Providences" (1842-1843); and the Wodrow Society (formed in Edinburgh in 1841 for the publication of works of the early writers of the Reformed Church of Scotland) has published "Wodrow's Correspondence" (1842-1843), under the editorship of the Rev. Thomas McCrie. Wodrow died in Eastwood, March 26, 1734.

WOFFINGTON, MARGARET, a British actress; born in Dublin, Ireland, Oct. 18, 1720. She grew up a girl of remarkable grace and beauty, and, still a child, became a pupil of Madame Violante, mistress of the rope-dancing booth. From 17 to 20 she played on the Dublin stage all manner of parts, from Ophelia to Sir Harry Wildair, and on Nov. 6, 1740, made her first appearance at Covent Garden as Sylvia in the "Recruiting Officer." Her beauty and grace, her pretty singing and vivacious coquetry and the exquisite art especially of her male characters carried all hearts by storm. Her one drawback was the harshness of her voice, yet this in no degree hindered the completeness of her triumph. Peg Woffington was always singularly independent and something whimsical in her moods, but she kept the affection of the public till the tragic close of her career. On May 3, 1757, she broke down in playing Rosalind, and left the stage forever. She died in Teddington, March 28, 1760.

WOFFORD COLLEGE, a coeducational institution in Spartanburg, S. C.; founded in 1854 under the auspices of the Methodist Episcopal Church; reported at the close of 1919: Professors and instructors, 12; students, 294. President, H. N. Snyder, M. A.

WOLCOT, or WOLCOTT, JOHN (PETER PINDAR), an English poet; born in Dodbrooke, England, in May 1738. His satires involved him in many quarrels. So effective were his attacks on the king, that the ministry silenced him with a pension of $1,500 per annum. He was an art critic of taste and penetration far beyond his time; his yearly reviews in verse of the Academy Exhibitions are much the best of his work, and still instructive. Some of his satires are: "Lyric Odes"; "An Epistle to the Reviewers"; "Peeps at St. James"; "Royal Visits"; and "The Lousiad." He died in London, England, Jan. 14, 1819.

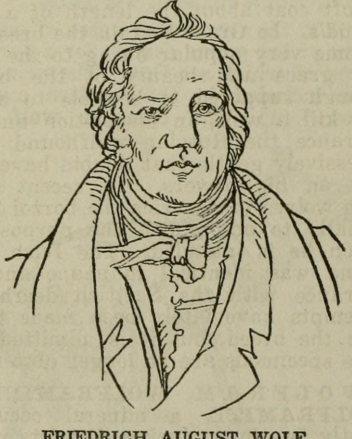
WOLF, the vernacular name of certain species of the genus *Canis;* for a general account of which see DOG. The principal forms included in this section are as follows: (1) The common wolf (*C. lupus*) has very much the appearance of a large, long-legged, bareboned dog, with a long tail, which hangs over its haunches instead of being curled upwards. Distinguishing characters are to be found in the lank body, length of the snout in proportion to the head, sloping



GRAY WOLF

forehead, oblique eyes, and erect ears. The fur varies according to the climate with respect both to its nature and color. In the N. it is long and thick—longest on the belly and legs, bushy on the tail, and erect on the neck and sides—while in the S. it is generally shorter and rougher. The color is usually pale yellowish gray mingled with black, lighter, often whitish gray below. It undergoes some change with the season, including to red in the summer, in the winter to yellow, which becomes white in the N.; it is of a darker hue in the S. The forehead is whitish gray, the snout yellowish gray, always mingled with black, the lips whitish and the cheeks yellowish, sometimes distinctly striped. A full grown wolf measures 5 feet 5 inches in length, whereof 18 inches belong to the tail; its height is 33 inches, and its weight over 100 pounds. The wolf's natural voice is a loud howl, but when confined with dogs, it will learn to bark.

WOLF, FRIEDRICH AUGUST, a German scholar and critic; born in Haynrode, near Nordhausen, Prussia, Feb. 15, 1759. Before leaving the gymnasium of Nordhausen, he had not only read the chief ancient authors, but had acquired an extensive knowledge of the languages and literatures of France, England, Italy and Spain. In 1777 he entered the University of Göttingen, but was an ir-



FRIEDRICH AUGUST WOLF

regular attendant at professors' lectures, giving himself chiefly up to intense and solitary study. As a consequence he was hardly known, and where known not particularly liked. In 1782 he was appointed rector of the Bürgerschule at Osterode in the Harz, and next year he was called to Halle as Professor of Philosophy and Paideutics. Here he labored upward of 20 years with the highest enthusiasm for the cause of education. His ambition was to produce a great race of teachers, who should be instinct with the noblest and purest spirit of antiquity. In 1793 appeared his great work, "Prolegomena ad Homerum" (3d and 4th eds. 1872 and 1875).

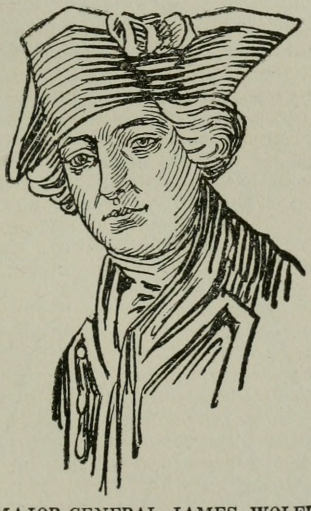
In 1824 he went S. on a voyage for the sake of his health, but died in Marseille, Aug. 8, of that year.

WOLFE, CHARLES, an Irish poet; born in Dublin, Ireland, Dec. 14, 1791; was educated at Trinity College, Dublin, and it was while there that the poem which has secured his fame, "Ode on the Burial of Sir John Moore," was published in the "Newry Telegraph" (1817). He was also the author of several other poems, and his "Remains" were published at Dublin (1825). He died at the Cove of Cork (now Queenstown), Ireland, Feb. 21, 1823.

WOLFE, JAMES, an English military officer; born in Westerham vicarage, Kent, Jan. 2, 1727; was educated at Westerham and Greenwich. From the first he was bent upon following his father's profession of arms; and, balked by illness at 13 of a share of the unfortunate Cathagena expedition, in 1742 he received an ensign's commission in a foot regiment. In 1743 he took part in the famous battle of Dettingen, boy though he was, as adjutant of his regiment; in 1744 he obtained his captaincy; and in 1745-1746 he served against the Scotch, being present at the battles of Falkirk and Culloden. Again abroad on service in 1747, he was wounded, though not seriously, at the battle of Lawfeld, and so distinguished himself that he was publicly thanked by the Duke of Cumberland. From 1749 to 1757, with occasional interruptions, such as a six months' residence in Paris, he was engaged in garrison duty in Scotland and England; his interesting correspondence with his mother shows that he had no great liking for the former country and its inhabitants. In the mismanaged expedition against Rochefort (1757) Wolfe acted as quartermaster-general. The total failure of the operations brought disgrace to nearly all concerned; but it became known that had Wolfe's counsels been followed the result would almost certainly have been different. Pitt's attention was now first decisively drawn to him as an officer of whom great things might be expected; and in 1758, with the full rank of colonel, he was appointed to the command of a brigade in the expedition against Cape Breton under General Amherst. A brilliant success was obtained in the capture of the strong fortress of Louisberg, after a seven weeks'

siege, and he became popularly known as the "Hero of Louisburg."

Pitt was now organizing his grand scheme for expelling the French from Canada; he sought for merit wherever it was to be found; and the expedition which had for its object the capture of Quebec, the enemy's capital, he confided to Wolfe's command, allowing him, as far as possible, a *carte blanche* in the choice of his subordinate officers. Advanced to the rank of Major-General, and commanding 9,000 men, Wolfe sailed from England on Feb. 17, 1759, and on June 26 landed his forces on the Isle of Orleans, opposite Quebec. The system of defense adopted by his adversary, the skillful and wary Montcalm, was such as to offer no point of advantage. The season wore fast away during which operations could be continued; but at last, having dropped down the river, and scaled the cliffs at a point insufficiently guarded —a feat of such frightful risk as in war has scarcely a parallel—at daybreak of Sept. 13, Wolfe found himself on the



MAJOR-GENERAL JAMES WOLFE

Plains of Abraham, where, his supplies thus cut off, Montcalm had no choice but to give battle. After a short struggle the French were driven from the field in complete rout; Montcalm was one of 500 killed; the capitulation of Quebec followed five days after and its fall decided the fate of Canada. Wolfe died in the hours of victory, Sept. 13, 1759. In person he led the right, till thrice wounded, he was carried to the rear. He lived to hear the cry, "They run; see how they run!" and expired with the words, "Now God be praised, I will die in peace." His body was taken home and buried in Greenwich church, and a monument was erected to him in Westminster Abbey.

WOLFENBÜTTEL, an old town of Brunswick, Germany; on the Oker; 7 miles S. of Brunswick. One of the old churches contains many of the tombs of the princes of Brunswick. The old castle now accommodates a seminary for teachers and a theater. The library opposite, built in 1723 in the form of the Pantheon at Rome, became famous for its literary wealth and for the fact that Lessing was its librarian. It was Lessing who edited the "Wolfenbüttel Fragments," professedly from anonymous MSS. under his charge, but really from the pen of his friend Reimarus, which startled the theological world of Germany. The Pantheon building had become so rickety and dangerous that it had to be taken down, being superseded in 1887 by a handsome new edifice. There are in the town manufactures of copper goods, flax, cloth, cork, leather, preserves, tobacco, etc. The place is very ancient, and dates from 1046; it was besieged and taken in 1193 and 1542; and during the Thirty Years' War a battle was fought here. Pop. about 20,000.

WOLFHOUND, or **BORZOI**, a breed of dog first imported in numbers into England from Russia, about the year 1885. In shape the borzoi is like a gigantic greyhound, though covered with a soft coat about the length of a deerhound's. In Great Britain the breed has become very popular owing to the peculiar grace and beauty of the borzoi. Though supposed to be able to attack and kill a wolf, in disposition and appearance the Russian wolfhound is so excessively gentle that doubts have been cast on his powers. In recent trials with wolves in America the borzoi failed signally to accomplish the purpose for which he is intended. The Irish wolfhound was identical in shape and appearance with the Scottish deerhound. Attempts have lately been made to revive the breed, but it is admitted that pure specimens are no longer obtainable.

WOLFRAM, WOLFRAMINE, or **WOLFRAMITE**, a mineral occurring mostly in tin-producing districts, sometimes in abundance, to the detriment of the tin ores. Crystallization, orthorhombic, but usually found lamellar, massive. Hardness, 5-5.5; sp. gr., 7.1-7.55; luster, submetallic; color and streak, reddish-brown to black, opaque. Composition: A tungstate of iron and manganese, the proportions of which are variable, and lead to differing formulæ, though most can be represented by $2FeOWO_3 + 3MnOWO_3$, or $4FeWO_4 + MnOWO_4$.

WOLFRAM VON ESCHENBACH (vōlf'räm fon esh'en-bäh), next to Walther von der Vogelweide the greatest of Middle High German poets. He was poor and with a family, and could neither read nor write; but knew French and was of noble birth, which enabled him to frequent the court of Hermann of Thuringia. His chief works were three epic poems: "Parzival" (about 1210), the greatest of German court epics; "Titurel" (about 1210?), left unfinished; "Willehalm" (begun before 1216), left unfinished; both afterward completed by other hands. He wrote also lyrics, among which were four "Day Songs." He died about 1220.

WOLLASTON LAKE, a lake in the Northwest Territory, British America. It is about 50 miles long and finds its outlet in the Mackenzie river.

WOLLIN, an island of Prussia at the mouth of the Oder; on the N. side of the Great Haff; length, 20 miles; breadth from 3 to 10 miles. Fishing and cattle-rearing are the chief employments. Pop. about 15,000.

WOLLSTONECRAFT, MARY. See GODWIN, MARY.

WOLSELEY, GARNET JOSEPH, LORD, an English military officer; born near Dublin, Ireland, June 4, 1833; entered the army as ensign in 1852; took part in the second Burmese war (1852-1853), where he was severely wounded; served with distinction in the Crimea, and was wounded at the siege of Sebastopol; engaged in the siege and capture of Lucknow during the Indian mutiny of 1857-1858; and was employed in 1860 in the Chinese war. He was despatched to Canada in 1861, and again in 1867, having received command of the Red River expedition, which he carried to a successful issue. Three years afterward Wolseley (then K. C. M. G. and Major-General) was appointed to the command of an expedition to punish the King of Ashantee, and after a brief campaign he entered Coomassie (February, 1874), and received the submission of the king, being rewarded by a grant of $125,000 and the dignity of K. C. B. After the defeat of a British force by the Zulus in south Africa in 1879 he was despatched as high commissioner, but before his arrival the Zulus had been defeated at Ulandi, and little remained for him to do. His next command was in Egypt in 1882, where his forces successfully stormed the lines of Tel-el-Kebir and captured Arabi Pasha. For this he received the thanks of Parliament and was created a baron, his army rank being also raised to that of General. His next appointment was as Adjutant-General of the forces. When the Mahdi subdued the Sudan, and held General Gordon prisoner in Khartum, Wolseley was despatched in 1884 with a relief expedition. He concentrated his forces at Korti, and sent a column across the desert to Khartum, but before its arrival the place had fallen. On his return to England he was created a viscount. In 1888 he was made ranger of Greenwich Park; was commander of the forces in Ireland, 1890-1895; and was then made Field Marshal and Commander-in-Chief of the British army. He wrote: "Soldier's Pocket Book" (1886); the "Field Book for the Auxiliary Forces" (1873); and a "Narrative of the War in China" (1861); "Life of the Duke of Marlborough" (1894); "Decline and Fall of Napoleon" (1895); etc. He died in 1913.

WOLSEY, THOMAS, CARDINAL, an English prelate; born in Ipswich, England, in March, 1471; was educated at Magdalen College, Oxford, where he took his degrees as a scholar of distinction. After quitting the university he was appointed to the parish of Lymington in



CARDINAL THOMAS WOLSEY

Somerset. Then he became a private chaplain to the Archbishop of Canterbury, one of the governors of Calais, chaplain to Henry VII., and latterly Dean of Lincoln. When Henry VIII. became king, the advancement of Wolsey was rapid. Successively he was appointed Canon of Windsor, Dean of York, Bishop of Lincoln, Archbishop of York, and his nomination as cardinal in 1515 and Pope's legate in 1518 completed his ecclesiastical dignities. In 1515 he was also appointed lord-chancellor of the kingdom. He was twice a candidate for

the papacy, and his power in England, as also his revenues, were only equalled by those of the crown. Part of his immense revenues he expended in display, and part more laudably for the advancement of learning. He projected on a magnificent scale the College of Christ Church at Oxford; founded several lectures, and built the palace of Hampton Court, which he presented to the king. This rapid preferment by the king was largely the result of a remarkable series of diplomatic victories, in which Wolsey had been the means of enabling Henry to hold the balance between Francis I. and the Emperor Charles V. His success in the region of politics terminated in the splendors of the Field of the Cloth of Gold (1520). In his ambitious career the cardinal had made many enemies, who were held in check so long as he retained the favor of his royal master. This favor Wolsey lost when he failed to obtain from Pope Clement a decision granting the king's divorce from Catharine of Aragon. Thenceforth the enemies of the fallen prelate harried him unmercifully. He was banished from court, stripped of his dignities, found guilty of a præmunire, and sentenced to imprisonment. Finally, after a brief respite, during which he was restored to some of his offices, and had returned to his see of York, he was arrested at Cawood Castle on a charge of high treason, and on his way to London as a prisoner died in Leicester Abbey, Nov. 29, 1530.

WOLVERHAMPTON, a town of S. Staffordshire, England; 12¾ miles N. W. of Birmingham; on rising ground amid a network of railways and canals. Of its numerous churches the finest and most ancient is the cruciform St. Peter's, which, dating from the 14th century, was enlarged and elaborately restored (1859-1865). The public buildings include a town hall, corn exchange, market hall, agricultural hall, theater, free library, an Athenæum, concert hall, etc.; and there are also an orphanage, the Southern Staffordshire Hospital, and a free grammar school (founded 1515; rebuilt 1874). Lock making has for more than two centuries been Wolverhampton's staple industry, next to it rank tinplate working, japanning, and galvanizing, and there are besides large iron and brass works, smelting furnaces, chemical, coal, grease, color, and varnish works, etc., and in the neighborhood collieries, ironstone mines and quarries. Pop. about 100,000.

WOMAN'S CHRISTIAN TEMPERANCE UNION, The National Woman's Christian Temperance Union was organized in Cleveland, O., in 1874, and is the sober second thought of the great woman's crusade. It is now regularly organized in the 48 States of the Union, and in every Territory. There are about 10,000 local unions, with a membership and following, including the children's societies, of about 500,000. The Woman's Christian Temperance Union has 40 distinct departments of work, presided over by as many women experts, in the National society, and in nearly every State. All the States in the Republic except one have laws requiring the study of scientific temperance in the public schools, and all these laws were secured by the Woman's Christian Temperance Union; also the laws forbidding the sale of tobacco to minors. The first police matrons and most industrial homes for girls were secured through the efforts of this society, as were the refuges for erring women. Laws raising the age of consent and providing for better protection for women and girls have been enacted by many Legislatures through the influence of the department for the promotion of social purity. The World's Woman's Christian Temperance Union was founded through the influence of Frances E. Willard in 1883, and already has auxiliaries in more than 40 countries and provinces. The white ribbon is the badge of all the Woman's Christian Temperance Union members, and is now a familiar emblem in every civilized country. The headquarters of the National organization is Rest Cottage, Evanston, Ill. The organization was active in bringing about the passage of the Woman Suffrage Amendment.

WOMAN'S RELIEF CORPS, an organization created by the mothers, wives, daughters, and sisters of Union soldiers of the Civil War of 1861-1865, for the purpose of aiding and assisting the Grand Army of the Republic, and to "perpetuate the memory of their heroic dead," to "extend needful aid to the widows and orphans," to "cherish and emulate the deeds of our army nurses," and to "inculcate lessons of patriotism and love of country among our children and in the communities in which we live." The organization is composed of departments, which are subdivided into corps, as well as detached corps in several States where no departments exist.

WOMAN SUFFRAGE, the right of women to cast their votes in political elections on the same plane with men. The exclusion of women from this right, or privilege, is probably a survival from barbaric ages, when men only were qualified to gather around the council fires and discuss plans for warfare. In

the early part of last century, however, women appeared in all countries who claimed the right of their sex to participate in the government of democratic countries. In this country it is notable that New Jersey, on becoming a member of the Federal family of States after the Revolution, placed only one restriction on the general suffrage, which was the possession of less than $250 in cash or property, the election laws referring to the voters as "he or she." In 1790 the law was revised to specifically include women, but so obnoxious did they become to the professional politicians that in 1807 the law was again revised to exclude them, obviously an unconstitutional act, since the State constitution specifically made any such change dependent on the general suffrage.

During the early part of the century, however, agitation for equal suffrage was carried on by only a few individuals. The first of these was Frances Wright, a Scotch woman, who came to this country in 1826 and advocated woman suffrage in an extensive series of lectures. In 1836 Ernestine L. Rose, a Polish woman, came to this country and carried on a similar campaign, so effectively that she obtained a personal hearing before the New York Legislature, though her petition bore only five signatures. She was shortly afterward joined in her propaganda by Elizabeth Cady Stanton and Paulina Wright Davis. At about the same time, in 1840, Lydia Mott and Mary Fuller became active in Boston, the latter being the author of the book "The Great Lawsuit; Man vs. Woman."

During the Civil War and immediately after little was heard of the movement, but in 1869 the National Woman Suffrage Association was formed, with the object of securing an amendment to the Federal Constitution in favor of woman suffrage. Another organization, the American Woman Suffrage Association was also formed at this time by those who believed that suffrage should be brought about by constitutional amendments within the various States. In 1890 these two bodies united into one national organization, known as the National American Woman Suffrage Association.

In 1900 regular national headquarters were established in New York City, under the direction of the president, Mrs. Carrie Chapman Catt. Three years later headquarters were removed to Warren, O., but were brought back to New York shortly afterward and opened there on a much bigger scale. The organization obtained a hearing before every Congress, from 1869 to 1919.

Meanwhile local experiments in woman suffrage had already been made. The first Territorial legislature of Wyoming granted woman suffrage in 1869, Utah doing likewise in the following year. In 1890 Wyoming came into the Union as the first woman suffrage State. In 1893 voters of Colorado made that State the second of the woman suffrage States. In 1895 Utah adopted a constitution in which woman suffrage was provided for. One after another, Western States granted the right of voting to their women citizens, the only opposition being presented by the liquor interests and the machine politicians. The procession was brought up with New York State, that old battle ground for suffrage, in 1917.

Meanwhile efforts to obtain an amendment to the Federal Constitution had not abated. Finally, on January 12, 1915, a bill to this effect was brought before the House of Congress, but was lost by a vote of 174 against 204. Again a bill was brought before the House, on January 10, 1918. On the evening before President Wilson made a strong and widely published appeal to the House to pass the bill. It was passed with one more vote than was needed to make the necessary two-thirds majority. The fight was now carried into the Senate. Again President Wilson made an appeal, and on September 30, 1918, the question was put to the vote, but two votes were lacking to make the two-thirds majority. On February 10, 1919, it was again voted upon, and then it was lost by only one vote.

There was now considerable anxiety among politicians of both parties to have the amendment passed and made effective before the general elections of 1920, so the President called a special session of Congress, and a bill introducing the amendment was brought before the House again. On May 21, 1919, it was passed, 42 votes more than necessary being obtained. On June 4, 1919, it was brought before the Senate, and after a long discussion it was passed, with 56 ayes and 25 noes. It only remained now that the necessary number of States should ratify the action of Congress. Within a few days Illinois, Wisconsin and Michigan, their legislatures being then in session, passed the ratifications. One after another the other States followed their examples, Connecticut being the last of the needed 36 States to ratify, in the summer of 1920. The amendment was now an accomplished fact and the Presidential election of November, 1920,

was therefore the first occasion on which all American women were allowed to exercise their right of suffrage.

WOMEN'S CLUBS, GENERAL FEDERATION OF, in the United States, an organization incorporated in 1892, and composed of over 2,675 women's clubs having a membership of 155,000 women in the United States and foreign countries. The purpose of the Federation is declared in its articles of incorporation to be "to bring into communication with one another the various women's clubs throughout the world, that they may compare methods of work and become mutually helpful. Constitutions of clubs applying for membership should show that no sectarianism or political test is required, and, while the distinctively humanitarian movements may be recognized, their chief purpose is not philanthropic or technical, but social, literary, artistic, or scientific culture." Meetings of the federation are held biennially. There are State federations auxiliary to the General Federation in all the States.

WOOD, in a botanical sense the hard, solid, non-succulent stem of any plant, and in a chemical sense, lignin, a hardened form of cellulose, the principal constituent of all vegetable life, with a small proportion of resinous and incrusting matter. Wood thus only differs from vegetable fibers—cotton, flax, hemp, etc. —in its physical condition. Woody stems are divided into two great classes, according to the manner in which they grow. The first and most important class is the exogens or exogenous stems, so called on account of the annual increments being added on the outside of the stem just within the bark, and the layers of growth are seen in such stems in a series of concentric circles, each ring of which represents the growth of one year. This class embraces all the trees of temperate climates, and, indeed, the greater part of all tree life. The second class—endogenous stems—shows no rings of annual growth, but a cross section exhibits a series of dark spots, more or less closely studded, and always more densely packed toward the outer circumference.

WOOD, ANTHONY, called ANTHONY A. WOOD, an English antiquary; born in Oxford, England, Dec. 17, 1632; spent most of his life in collecting data relating to the history of Oxford University. He wrote: "History and Antiquities of the University of Oxford"; "An Exact History of All the Writers and Bishops Who Have Had Their Education in the University of Oxford, from 1500 to 1690"; "Modus Salium: A Collection of Pieces of Humor" (1751); and "The Ancient and Present State of the City of Oxford" (1773). He died in Oxford, Nov. 28, 1695.

WOOD, SIR EVELYN, a British Field-Marshal, born at Braintree, Essex, in 1838. He was educated at Marlborough College, later passed the Staff College, and became a barrister of Middle Temple in 1874. He entered the navy in 1852, served in the Crimea. In 1855 he joined the army and served in India, and later in the Ashantee, Kaffir, Zulu and Transvaal wars. He commanded the expedition to Egypt in 1882,



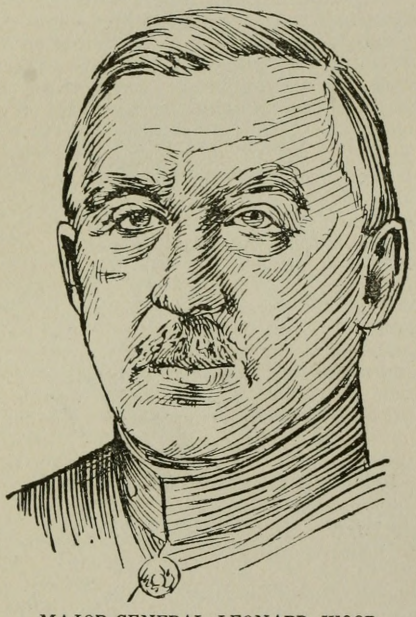
FIELD-MARSHAL SIR EVELYN WOOD

later served in the Nile Expedition, and returning to England became Adjutant-General to the Forces 1897-1901. He was made Constable of the Tower in 1911. His works include: "The Crimea in 1854" (1894); "From Midshipman to Field-Marshal"; "The Revolt in Hindustan"; "Our Fighting Services and How They Made the Empire." He died in 1919.

WOOD, FERNANDO, an American politician; born in Philadelphia, June 14, 1812. In 1820 he removed to New York City and entered business as a shipping merchant. He became identified with political organizations, being elected to Congress in 1841 on the Democratic ticket, serving one term. In 1850 he retired from business and in 1854 was elected Mayor of New York; introduced various reforms and was re-elected almost without opposition. The riot

troubles of 1857 prejudiced many citizens against the municipal administration and he was defeated for re-election, but was again Mayor in 1859. In 1861, when secession was under discussion, he recommended that New York should secede and become independent. He was elected to Congress in 1863 and 1867. He died in Washington, D. C., Feb. 14, 1881.

WOOD, LEONARD, an American soldier. He was born in Winchester, N. H., in 1860, and after attending Pierce Academy, Middlesboro, Mass., graduated from the Harvard Medical School, in 1884. In 1886 he became assistant surgeon in the United States Army, and at the same time acted as a line officer of Captain Lawton's expedition against the Apache Indians. For gallantry of service in this campaign, he received the Congressional Medal of Honor, in 1898.



MAJOR-GENERAL LEONARD WOOD

At the outbreak of the Spanish-American War, he, together with Theodore Roosevelt, organized a regiment of "Rough Riders", and he commanded this regiment as colonel, with Roosevelt as lieutenant-colonel, at Las Guasimas, Cuba. He commanded one of the brigades of General Wheeler, at San Juan Hill. He was commissioned colonel of the 1st United States Volunteer Cavalry, in 1898, and this was followed by his appointment as major-general in December of the same year. Following the surender of the Spanish forces in July, 1898, he was given command of Santiago, and in the following October was placed in command of the Department of Santiago. In 1899 he became Governor-General of Cuba, succeeding General Brook. He held that position until the final withdrawal of the United States Forces from the island. He practically reconstructed the administration of Cuba, and established his reputation as an executive and administrator of high order. In 1903 he was given command of a division of the United States Army in the Philippines, and in the same year was made major-general in the Regular Army. In 1909 he commanded the Department of the East. He was special ambassador to Argentina in 1910, and from that year until 1914 was chief of staff of the United States Army. In 1914 he was again appointed commander of the Department of the East. At the outbreak of the World War, he was one of the leading advocates of vigorous measures for military preparedness on the part of the United States. He was prominently mentioned as the commander of the American Forces in France, but this assignment was given instead to General Pershing. General Wood, however, was in France for several months in 1917, and was wounded by the explosion of a shell. Returning to the United States, he organized and trained the 89th National Army Division, and the 10th Regular Army Division. He also trained various special regiments and battalions. In 1919 he was appointed commander of the Central Department, with headquarters at Chicago. General Wood was the leading candidate for the Republican nomination for the presidency, prior to the convention held in Chicago, and a strong effort was made throughout the country to bring about his nomination. He was, however, unable to command sufficient votes in the convention. He continued to command the Central Department in 1920. In 1921 President Harding sent him on a special mission to the Philippines in order to determine the question of independence of the islands. In the same year he was tendered the presidency of the University of Pennsylvania. He wrote "The Military Obligation of Citizenship" (1915); "Universal Military Training" (1917); "Our Military History, Its Facts and Fallacies."

WOOD, THOMAS JOHN, an American military officer; born in Munfordville, Ky., Sept. 25, 1823; was graduated at the United States Military Academy in 1845; served with General Taylor in the Mexican War, taking part in the battles of Palo Alto, Monterey, and

Buena Vista; served on the Texas and Kansas frontier for 12 years; and through the Civil War in the Army of the Cumberland, being present at all the battles of that army including Shiloh, Perryville. Chickamauga, Missionary Ridge, the Atlanta campaign, Franklin, Nashville, and at Stone River, where he was severely wounded; and was engaged in operations for the relief of Knoxville and the invasion of Georgia till he was again severely wounded at Lovejoy's Station. He was promoted Major-General of volunteers in 1865; and mustered out of the volunteer service Sept. 1, 1866. He was brevetted 1st lieutenant, U. S. A., for gallant and meritorious conduct in the battle of Buena Vista, Brigadier-General for Chickamauga, and Major-General for Nashville. He died in 1906.

WOODBERRY, GEORGE EDWARD, an American poet; born in Beverley, Mass., May 12, 1855; was graduated at Harvard College in 1877; was Professor of English Literature in Nebraska State University in 1877-1878 and 1880-1882; of Comparative Literature, Columbia, 1891. He retired from this post, 1904. Besides articles in magazines and reviews, he wrote: a "History of Wood Engraving" (1883); "Life of Edgar Allan Poe" (1885); and "The North Shore Watch, and Other Poems" (1890); "Studies in Letters and Life" (1890); "Heart of Man" (1899); "Wild Eden" (1899); "Makers of Literature" (1900); "The Appreciation of Literature" (1907); "The Inspiration of Poetry" (1910);" "Two Phases of Criticism" (1918); "The Roamer and Other Poems" (1919). He published also an edition of Shelley (1892), and one of Poe (1895), with E. C. Stedman.

WOOD CARVING, an art of great antiquity, now followed largely in France, Italy, and Switzerland. In recent years it has been made a part of the manual training courses in the public schools of the United States.

WOODCOCK, in ornithology, the *Scolopax rusticula* (the *rusticola* of Linnæus is a misscript); distributed over Europe, the N. of Asia, and as far E. as Japan, visiting Europe in October and departing in March, though some remain to breed, and the number is yearly increasing. The woodcock is about 13 inches long; upper surface varied with ruddy, yellowish, and ash tints, and marked with great black spots; lower parts yellowish-red with brown zigzags; quills striped with red and black on their external barbs, tail feathers terminated above with gray and below with white. The female is rather larger and stouter than the male.

WOOD ENGRAVING, the art of engraving designs on wood. It differs from copper and steel plate engraving by having the parts to be printed on the paper in "relief." While plates are printed from the engraved lines by a laborious and necessarily slow process wood engravings, having the object to be represented on the surface, in the manner of a type, may be printed along with the matter they are intended to illustrate on the ordinary printing machine. This, of course, is an important point in the illustration of books, on the ground of cheapness and expedition. Another advantage wood engravings possess is that they can be multiplied to any extent by means of the electrotype process.

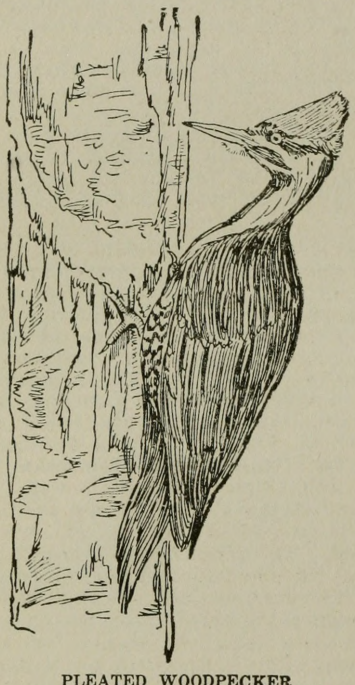
Previous to the invention of movable types whole books of text were also engraved in wood, and the impressions had evidently been taken by rubbing on the back of the paper, instead of steady pressure, as in the printing press, the ink used being some kind of distemper color.

WOODFORD, STEWART LYNDON an American lawyer; born in New York City, Sept. 3, 1835; served with gallantry in the Civil War, retiring with the rank of Brigadier-General of volunteers by brevet; on the cessation of hostilities he resumed the practice of law; in 1866 was elected lieutenant-governor of New York on the ticket with Reuben E. Fenton; in 1872 member of Congress from the 3d Congressional District (Brooklyn); in 1877 appointed United States Attorney for the Southern District of New York. In 1897 he was appointed minister to Spain, which post he held till the beginning of the Spanish-American War in 1898. He died in 1913.

WOOD NYMPH, a fabled goddess of the wood; a dryad. In zoölogy, the common name of the beautiful lepidopterous insects comprising the genus *Eudryas*. The wood nymph (*E. grata*) expands one inch and a half to one inch and three-fourths, the fore wings pure white, with a broad stripe along the front edge for more than half its length, and a broad band around the outer hind margin, of a deep purple brown, the band edged on the inside with olive green, and marked toward the edge with a wavy white line; under side of the fore wings yellow, with a round and kidney-shaped black spot. The hind wings are yellow, with a broad purplish brown hind border above, on which there is a wavy white line; below they have a central black dot. The caterpillar, which infests the grape vine, attains one inch and a quarter in length, is blue transversely, banded

with deep orange, the bands dotted with black; the top of the eleventh ring is humped.

WOODPECKER, in ornithology, the popular name of the old Linnæan genus *Picus*, now greatly divided. Woodpeckers have a slender body, powerful beak, and protrusile tongue, which is sharp, barbed and pointed, and covered with a glutinous secretion derived from glands in the throat, this coating being renewed every time the tongue is drawn within the bill. The tail is stiff, and serves as a support when the birds are clinging to the branches or stems of trees. The plumage is generally of strongly contrast-



PLEATED WOODPECKER

ed colors, black and white, or green and yellow, with red marks about the head. Woodpeckers are very widely distributed, but abound chiefly in warm climates. They are solitary in habit, and live in the depths of forests. Fruits, seeds, and insects constitute their food, and in pursuit of the latter they exhibit wonderful dexterity, climbing with astonishing quickness on the trunks and branches of trees, and when, by tapping with their bills, a rotten place has been discovered, they dig vigorously in search of the grubs or larvæ beneath the bark. The common notion that they are injurious to trees is erroneous, as they do more good by preventing the ravages of insects than harm by their pecking. They roost and breed in hollow trunks, or holes in trees, enlarged by their strong, sharp bills; the eggs, which are white, smooth, and glossy, vary considerably in number, and are deposited on a bed of chips at the bottom of the hole.

WOOD PULP, a preparation of wood used in the manufacture of paper and in other industries. There are two kinds of wood pulp, one known as ground or mechanical, and the other as chemical. The first is the cheapest and is used chiefly for making newspaper and common wrapping paper stock. In this kind spruce wood is most commonly employed, because it is cheap and gummy, the latter quality being valuable in that it adds much to the tenacity of the material made from the pulp. In the manufacture of ground pulp swiftly revolving emory wheels are worked under water. The spruce logs are pressed against these till reduced to a fine wet sawdust. It has, however, now lost its fiber, and must be mixed with one-fifth chemical wood pulp, so that it will hold together in the form of paper.

WOODS HOLE, a village in Barnstable co., Mass.; on Buzzards Bay; and on the New York, New Haven and Hartford railroad, 72 miles S. E. of Boston. It is the seat of one of the most important stations of the United States Fisheries Commission, where lobsters, sea bass, cod, and other food fishes are propagated. Besides an extensive fish hatchery, the station is equipped with an excellent marine biological laboratory, in which a corps of efficient teachers annually give instruction to a large number of students. Woods Hole has also long been celebrated as a harbor of refuge for shipping.

WOODSTOCK, a market town of Oxfordshire, England, on the Glyme, 7 miles N. N. W. of Oxford; has a chapel mostly rebuilt in 1785, but retaining fragments of 12th century work. The glory of the place is Blenheim Palace, in whose park, laid out by Capability Brown, the tiny Glyme is spanned by a mighty bridge, then widens into an artificial lake, while the trees are ranged as were the troops at Marlborough's victory. The palace itself, designed by Vanbrugh, covers seven acres, and is a heavy, imposing pile, with rich art collections, though its "Titian Gallery" was destroyed by fire in 1861. Glove sewing is the leading industry of Woodstock. The legends of Fair Rosamond's labyrinth and murder by Queen Eleanor, of Ælfred's and Chaucer's residence at Woodstock, must be abandoned; but as

a royal manor from immemorial times Woodstock has played a part in history. Here Æthelred held a gemót, Malcolm and Rhys paid homage, Edward the Black Prince was born, and Elizabeth was kept in ward by Mary. Here, too, the "just Devil" disturbed the Parliamentary commissioners, as told in Scott's romance, and Rochester made an edifying end. Lastly, in 1704, came the grant to the victor of Blenheim, and the ruthless demolition of the ancient manor house.

WOODWARD, ROBERT SIMPSON, an American scientist; born in Rochester, Mich., in 1849. He graduated from the Engineering Department of the University of Michigan in 1872. From that year until 1882 he was assistant engineer of the United States Lake Survey. From 1884 to 1890 he was astronomer, geographer, and chief geographer of the United States Geological Survey. He was an assistant of the United States Coast and Geodetic Survey from 1890 to 1893, and from that year until 1905 was professor of mechanics and mathematical physics at Columbia University. From 1895 to 1905 he was dean of the School of Pure Science at that university. In the latter year he became the president of the Carnegie Institution of Washington. From 1915 he was a member of the Naval Consulting Board. He was also a member of many scientific societies. He published monographs, reports, and memoirs on scientific subjects.

WOOL, the fleecy covering or pile of the sheep, and some other animals, as the alpaca, the vicuna, and some species of goats. Wool is generally divided into three classes, long, short, and coarse or carpet wool; and these are divided into subordinate classes according to fineness. It differs from all other varieties of hair by the corrugated nature of its fibers, due to the epithelial scales which overlap the course of its fibers, under certain conditions, from their corrugation, interlock with each other and form a felted fabric. Wool is divided into pulled or clipped fleece wool. Pulled wool is pulled by the roots from the skin of the dead animal, the clipped is shorn from the living one. Short-staple wool is used in cloth manufacture, and is frequently called clothing wool. To this class belong the Saxon and Silesian wool of Germany, a portion of the wool of Australia, of the Cape of Good Hope, Buenos Aires, Russia, Canada, and the bulk of the wool produced in the United States, all being of immediate or remote Merino blood. The quantities and values of these are about in the order in which they are inserted above, the Saxony wool being best adapted to the very finest qualities of broadcloths. Short-staple wool may vary in length from 1 to 3 or 4 inches; if it be longer it requires to be cut or broken to prepare it for manufacture. The felting property of wool is well known. The process for hat making, for example, depends entirely on it. The wool of which hats are made is neither spun nor woven, but locks of it being thoroughly intermixed and compressed in warm water cohere and form a solid tenacious substance. Cloth and woolen goods are made from wool possessing this property; the wool is carded, spun, woven, and then, being put in the fulling mill, the process of felting takes place. The strokes of the mill make the fibers cohere; the piece subjected to the operation contracts in length and breadth, and its texture becomes more compact and uniform. This process is essential to the beauty and strength of woolen cloth. But the long wool of which stuffs and worsted are made is deprived of this felting process. This is done by passing the wool through heated iron combs, which takes away the laminæ or feathery part of the wool, and approximates it to the nature of silk or cotton. Long-staple wool is also called combing wool and delaine wool. To this class belong the long lustrous, down-combing English wool of Leicester, Lincolnshire, and Cotswold; the soft-combing wool of Rambouillet of France; the soft long-staple wool of Australia; the cheviot of Scotland, and the combing wool of Canada, Ohio, Kentucky, Pennsylvania, New York, Maine, and other parts of the United States, all derived from the Leicester or other English blood. The French and Australian are most esteemed for women's dress goods, such as merinos, cashmeres, thibets, and the like; the cheviot for Scotch tweeds, and the English usually for worsted goods. The American wools of this class are of medium quality. Long wool may vary in length from 3 to 8 inches. The shorter combing wools are principally used for hose, and are spun softer than long-combing wools; the former being made into what is called hard and the latter into soft worsted yarn. To the third class, the coarse-staple wools which are adapted for carpets, belong the Donski, and other coarse Russian wool, the native South American, Cordova, Valparaiso, native Smyrna, and other wool.

The art of forming wool into cloth and stuffs was known in all civilized countries, and in very remote ages. Woolen cloths were made an article of commerce in the time of Julius Cæsar and are familiarly alluded to by him. They were made in England before A. D.

1200, and the manufacture became extensive in the reign of Edward III. (1331). The policy of England toward the American colonies was directly intended to discourage and repress manufactures of all kinds, those of woolen goods included. The actual result was that the domestic manufactures of coarser or "home-made" cloths became very widely spread and considerable, and the importations of foreign cloths were proportionately small. A society organized in the limits of the present State of New York, in 1765, deprecated the use of foreign cloths and adopted various measures for increasing the home manufacture, even to rules requiring that the flesh of sheep and lambs should not be eaten nor the animals slaughtered. The supply of wool appears to have been large, and it was mostly worked up and disposed of within the colonies. Many thousands of weavers and cloth workers are said to have come over about the year 1774. The report of Alexander Hamilton on manufactures, in 1791, speaks of a mill for cloths and cassimeres in operation at Hartford, Connecticut, but conveys a doubt whether American wool was suitable for fine cloths. In 1794 there was a woolen factory in Newbury, Mass., and in the same year a carding machine for wool was put in operation in Pittsfield, Mass. President Madison's inaugural suit of black broadcloth was made at Pittsfield in 1804. The United States has produced the best invention for making felted goods, carpetings, and the like of any other country. The census of 1810 gives for New York the number of looms (largely in private hands) as 33,068 with 413 carding machines, 427 fulling mills, and 26 cotton factories. The total value of woolen manufactures for the United States in the same year was estimated at $25,608,788. From this time the domestic manufacture seems to have fallen off rapidly, and the succeeding census returns must be taken as indicating mainly the reproduction of factories.

The total production of wool in the United States in 1919 was 307,459,000 pounds, from 35,979,000 fleeces. The State having the largest wool production was Wyoming, with 33,415,000 pounds; Idaho was second, with 22,145,000 pounds; Montana third, with 17,750,000 pounds; Utah fourth, with 15,800,000 pounds; and Texas fifth, with 14,986,000 pounds. Other States producing over 5,000,000 pounds annually were California, Nevada, New Mexico, Ohio, Washington, South Dakota, Arizona, Colorado, Kentucky, Michigan, Missouri, and Pennsylvania. There were in 1919 444,892,834 pounds of raw wool imported in the United States, with a value of $19,486,001.

WOOL, JOHN ELLIS, an American military officer; born in Newburgh, N. Y. Feb. 20, 1784. On the breaking out of the War of 1812, he obtained a captain's commission, and distinguished himself at the storming of Queenstown Heights, where he was severely wounded, and for which he was promoted to the rank of major, and also at the battles of Plattsburg and Beekmantown, and for his gallantry in the last of these actions he was brevetted lieutenant-colonel. At the end of the war he was retained in the regular army; in 1818 appointed lieutenant-colonel; and in 1826 brevetted Brigadier-General. In 1832 he was sent to Europe, to examine the military systems of the principal nations, and was everywhere received with marked respect. On his return, he was appointed to inspect the coast defenses, and in 1836 was charged with the removal of the Cherokee Indians to Arkansas. At the breaking out of the Mexican War, General Wool was assigned the duty of organizing the volunteers, after which, with a body of 3,000 troops, he set out for the seat of war, where he distinguished himself by the strict discipline and order which he enforced. He was in a measure instrumental in gaining the battle of Buena Vista, for which he was favorably mentioned by General Taylor and brevetted Major-General, besides receiving the thanks of Congress and being presented with a sword. At the close of the war he remained in command of Monterey till order was restored. He was afterward transferred to the Department of the Pacific. At the outbreak of the Civil War, he hastened to offer his services to the Government, and was sent to New York to organize the volunteers. He took the responsibility of re-enforcing Fort Monroe, and thus saved that important post. In August, 1861, he was appointed to the Department of Virginia, and afterward to the command of the Middle Department, with his headquarters at Baltimore. In May, 1862, he was promoted Major-General, U. S. A. He died in Troy, N. Y., Nov. 10, 1869.

WOOL CARDING, an early process in woolen manufacture for disentangling or tearing apart the tussocks of wool, and laying the fibers parallel, preparatory to spinning. It is only the short staple wools that are submitted to this operation, the long staple wools being combed.

WOOLLEY, MARY EMMA, an American educator, born in Norwalk, Conn.,

in 1863. She graduated from Brown University in 1894. From 1886 to 1891 she was instructor at the Wheaton Seminary. In 1896 she was appointed associate professor of Biblical history at Wellesley College, and after filling several posts on the faculty of that institution, was appointed president of Mt. Holyoke College in 1900. She was a member of many learned and patriotic societies.

WOOLMAN, JOHN, an American Quaker preacher and anti-slavery writer; born in Northampton, N. J., in August, 1720. His writings contain the earliest protest published in America against the slave trade. His works include: "Some Considerations on the Keeping of Negroes" (Philadelphia, 1753 and 1762); "Considerations on Pure Wisdom," etc. (1768); "Considerations on the True Harmony of Mankind," etc. (1770); "Epistles to Quarterly Meetings of Friends," etc. (1772). His "Journal of Life and Travels" was published in Philadelphia in 1775, and edited by Whittier, 1871. He died in York, England, Oct. 5, 1772.

WOOLSACK, the name given to the seat of the Lord Chancellor of England in the House of Lords, whose essential portion is a large square bag of wool without either back or arms, and covered with red cloth, the whole forming a kind of cushioned ottoman, standing near the center of the chamber. It is believed that woolsacks were placed in the House of Lords in the time of Edward III. to remind the peers of the importance of England's staple trade. An Act of Henry VIII. directs that the Lord Chancellor, Lord Treasurer, or other high officer shall sit and be placed at the uppermost part of the sacks in the said Parliament chamber, either there to sit on one form or on the uppermost sack. D'Ewes says the Lord Keeper sat on the woolsack in 1559 when her majesty (Queen Elizabeth) was absent; the other woolsacks being as now allotted to the other judges. In 1621 it was declared in the standing orders of the House of Lords that "the Lord Chancellor sitteth on the Woolsack as Speaker to the House"—*i. e.* not in his judicial capacity.

WOOLSEY, THEODORE DWIGHT, an American educator; born in New York City, Oct. 31, 1801; was graduated at Yale College in 1820; studied law and later theology; was tutor at Yale in 1823-1825; licensed to preach in 1825; studied in Europe in 1827-1830; was Professor of Greek at Yale from 1831 to 1846; and then its president till 1871. In 1871-1881 he was president of the American company of revisers of the New Testament. Besides editions of Greek plays, etc., his works include an "Introduction to the Study of International Law" (5th ed. 1879); "Essays on Divorce and Divorce Legislation" (1869); "Political Science; or the State, Theoretically and Practically Considered" (2 vols. 1877); "Religion of the Past and of the Future" (1871); "Communism and Socialism" (1880); edited Lieber's "Civil Liberty and Self-Government" (1871) and a "Manual of Political Ethics" (1871). He died in New Haven, Conn., July 1, 1889.

WOOLSON, CONSTANCE FENIMORE, an American novelist and poet; born in Claremont, N. H., March 5, 1848. Her principal books are: "Castle Nowhere" (1875); "Rodman the Keeper" (1880); "Anne" (1882); "For the Major" (1883); "East Angels" (1886); "Jupiter Lights" (1889); "Horace Chase" (1894); "The Front Yard, and Other Italian Stories" (1895). She died in Venice in January, 1894.

WOOLWICH (wŏl'ich), a town and parliamentary borough of England, county of Kent, on the Thames, 8 miles below London Bridge. It stretches about 3 miles along the river, and owes its importance to the great arsenal, which has a circumference of 4 miles, and consists of gun and carriage factories, laboratory, barracks, ordnance departments, etc. At North Woolwich, on the opposite side of the river, many houses and extensive factories have of late years sprung up. Pop. about 120,000.

WOOLWORTH, FRANK W., an American merchant, born at Rodman, N. Y., in 1852. He received a public school education and also attended a business college. After serving an apprenticeship as clerk in stores in various cities in New York, he conceived the idea of establishing a store in New York in which no article should sell for more than 5c. He opened such a store in Utica, N. Y., in 1879, but removed to Lancaster, Pa., in the same year, where he opened a similar store. He opened stores in various cities, until before his death they numbered over 1,000 in the United States, and about 75 in Great Britain. These were controlled by the Woolworth corporation, of which he was president. The articles in his stores sold for either 5 or 10c. The stores were exceedingly profitable and he became the possessor of a large fortune. He built the Woolworth building, at the time of its construction the highest in the world, on lower Broadway, New York City. He died in 1919.

WOONSOCKET, a city in Providence co., R. I.; on the Blackstone river, and on the New England, and the New York, New Haven and Hartford railroads, 16 miles N. by W. of Providence. It contains a public library, churches of the principal denominations, a high school, Soldiers' Monument, fair grounds, waterworks, electric lights, National and savings banks, and daily and weekly newspapers. A bridge here crosses the river, besides numerous others. The city is the trading center of northern Rhode Island and adjoining Massachusetts towns. The prosperity of the city is chiefly due to its industries. It has large manufactories of cotton cloth, woolen and worsted mills, rubber shoe factories, knit goods, wringers, mill and general machinery, boxes, rubber boots, harness pads, etc. Pop. (1910) 38,125; (1920) 43,496.

WOORALI POISON, now generally called curara, obtained from the *Etrychnos toxifera*, and used by the South American Indians as an arrow poison. An alcoholic extract, called curara or curarin, is obtained from the crude woorali, which is in commerce a black-brown resinous mass, soluble in water, but slightly so in alcohol. The alcoholic extract, obtained by Roulin and Boussingault in 1828, was a solid transparent mass, of an excessively bitter taste, and possessed all the virulence of the woorali poison. The woorali poison contains no strychnine, but belongs to the narcotic rather than to the tetanic poisons. It is extremely virulent and rapid in its action, so much so that a large animal may be killed by a poisoned arrow in five minutes, and it may retain all its properties for an indefinite length of time if kept dry.

WOOSTER, a city and county-seat of Wayne co., O.; on Killbuck creek, and on the Pennsylvania and the Baltimore and Ohio railroads; 25 miles W. of Massillon. It is in an agricultural section. Here are Wooster University (Presb.), the Ohio Agricultural Experiment Station, a high school, court house, electric lights, waterworks, National and other banks, and daily, weekly, and monthly periodicals. It has manufactories of doors, sashes and blinds, carriages and wagons, paving brick, harness, furniture, flour, mill gearing, boilers, engines, pianos, etc. Pop. (1910) 6,136; (1920) 8,204.

WOOSTER UNIVERSITY, a coeducational institution in Wooster, O.; founded in 1866 under the auspices of the Presbyterian Church; reported at the close of 1919: Professors and instructors, 41; students, 671; president, Chas. F. Wishart, D. D.

WORCESTER, a city of Massachusetts, one of the two county-seats of Worcester co. It is on the Boston and Albany, the New York, New Haven and Hartford, and the Boston and Maine railroads. A street railway system connects it with neighboring towns and communities. The city is situated in a valley which is surrounded by hills of moderate height. There is a park system of over 1,000 acres. The largest parks are Green Hill Park, 500 acres; Boynton Park, 113 acres; Lake Park, 110 acres; and Elm Park, 86 acres. The notable buildings include a city hall, art museum, public library, State armory, court house, State lunatic asylums, and many business buildings. There are five hospitals, Y. M. C. A. and Y. W. C. A. buildings. There were in 1919 about 30,000 pupils in the public schools, with nearly 1,000 teachers. The cost of maintaining the public schools is about $1,500,000 annually. The assessed property valuation in 1919 was $160,837,100. There was a tax rate of $21.20 per thousand. The net public debt was $6,463,148.

Worcester is an important manufacturing city. There were in 1914 272 manufacturing establishments owned by individuals, 225 by corporations, and 109 otherwise owned. The value of the product was over $80,000,000. The industries include the manufacture of wire, looms, emery wheels, elevators, fire arms, cars, boots and shoes, clothing, leather goods, etc. Worcester is the seat of Clark University, Clark College, Holy Cross College, Worcester Polytechnic Institute, Worcester Academy, and many charitable institutions.

Worcester was founded in 1674, but the settlers were soon driven away by the Indians. A second attempt was made to found a settlement in 1684, but after a few years the Indians again forced the whites to withdraw. The place was permanently established in 1713. It was incorporated in 1822, and chartered as a city in 1848. Owing to its central location in the State, and in a rich agricultural region, it is known as the "Heart of the Commonwealth". Pop. (1910) 145,986; (1920) 179,754.

WORCESTER, a city of Worcestershire, England—and itself also a county—on the Severn; 22 miles S. W. of Birmingham. It is a handsome town, mostly of red brick. The chief building is the Cathedral of St. Mary, built of red sandstone in the form of a double cross, and measuring 425 feet in length, 145 feet in width, and 193 in height. The predominant styles are Early English and Dec-

orated. The cathedral, first erected (983), was rebuilt by Bishop Wulfstan (1084), and again (1281). Many alterations have since been made, and it has been elaborately "restored" at a cost of more than $500,000. It has a good tower with a clock and carillon of 12 bells, and contains the tomb of King John and of Prince Arthur, eldest son of Henry VII. Worcester has a guildhall, a grammar school, hop market, and elegant banks. Ruins of the castle and monastery of Worcester lie a short way S. of the cathedral. Glove-making has long been the staple industry of Worcester. The porcelain made here is also very famous for its delicacy and beauty of design. Iron foundries have existed from time immemorial, and tanning and rope-making are carried on. Worcester, which dates from prehistoric times, was successively a British fort, a Roman camp, an English stronghold, and a bishop's see (from 680). Destroyed by the Danes, it was rebuilt by Ethelred, sacked by Hardicanute (1041), and frequently by the Welsh during the following two centuries. A new charter was granted by James I. in 1622, and Worcester espoused the royal cause throughout the great rebellion; here Cromwell achieved his "crowning mercy," Sept. 3, 1651. For its constant fidelity to the royal cause, Worcester received from Charles the motto still on the city arms, "*Civitas in bello et in pace fidelis.*" Pop. about 52,000.

WORCESTER, DEAN CONANT, an American educator; born in Thetford, Vt., Oct. 1, 1866; was graduated at the University of Michigan in 1889; traveled in 15 of the Philippine Islands in 1887-1889; was instructor of animal morphology at the University of Michigan in 1893-1894, and became assistant professor in the latter year. In 1890-1892 he again traveled in the Philippines with Dr. F. S. Bourns, in a tour known as "the Menage Scientific Expedition." In January, 1899, he was appointed one of the United States commissioners to the islands to investigate and report on conditions there. Under the work of this commission civil government for the Philippines was inaugurated at Manila, July 4, 1901, with Judge Taft as the first civil governor. Until 1913 he was secretary of the Interior for the Philippines. Dr. Worcester was the author of "Preliminary Notes on the Birds and Mammals collected by the Menage Scientific Expedition to the Philippine Islands" 1894); "Contributions to Philippine Ornithology" (1898); "The Philippine Islands and their People" (1898); "The Philippines, Past and Present" (1913); and contributions to the elaborate "Report of the Philippine Commission" (1900).

WORCESTER, JOSEPH EMERSON, an American lexicographer; born in Bedford, N. H., Aug. 24, 1784. He was graduated at Yale in 1811, and very shortly began his life work as a dictionary maker. His first publication was: "A Geographical Dictionary, or Universal Gazetteer" (1817, revised 1823); followed by "Gazetteer of the United States" (1818); "Elements of Geography" (1819); "Sketches of the Earth and its Inhabitants" (1823); "Elements of History" (1826). In 1830 he published the "Comprehensive Pronouncing and Explanatory English Dictionary" (enlarged editions appeared 1847-1849-1855). In 1860 he published the great quarto, "Dictionary of the English Language" (illustrated), a standard authority wherever the English tongue is spoken. In 1820 he settled in Cambridge, Mass., and died there, Oct. 27, 1865.

WORCESTER COLLEGE, a part of Oxford University; founded in 1714, out of the older Gloucester Hall, by Sir Thomas Cookes, for a provost, six fellows, and six scholars. Of the fellows four, of the scholars five, must be sons of clergymen, needing support at the universities, and six of the remaining scholarships are for scholars of Bromsgrove School.

WORCESTER POLYTECHNIC INSTITUTE, a technical non-sectarian institution in Worcester, Mass.; founded in 1865; reported at the close of 1919: Professors and instructors, about 50; students, about 600; president, Ira N. Hollis, Sc. D.

WORDE, WYNKYN DE, an English printer; born probably in Lorraine. It is not known when he entered Caxton's service, but most likely it was at a very early age, as he was still living in 1535. In 1491 he succeeded to the stock-in-trade of his deceased master, but he did not append his name to his books till 1493. From about 1502 onward he worked in Fleet Street, London, at the sign of the Sun. He used on his books many varieties of Caxton's "mark," and Mr. Blades gives as many as 14 variant forms of his own name. Wynkyn de Worde made great improvements in the art of printing, and especially in that of type cutting. The books printed by him—408 in number, according to the list in Diblin's edition (1810) of Joseph Ames' "Typographical Antiquities"—are generally distinguished by their neatness and elegance, hardly by their accuracy, nor, a

few excepted, by the literary value of their contents.

WORDEN, JOHN LORIMER, an American naval officer; born in Sing Sing (now Ossining), Westchester co., N. Y., March 12, 1818; was appointed a midshipman in the navy, Jan. 10, 1834. At the beginning of the Civil War he was captured by the Confederates, and after being held seven months was exchanged. He was ordered to the command of John Ericsson's "Monitor," which was armed with two 11-inch smooth-bore Dahlgren guns, carrying a shot of 168 pounds, and which left New York March 6, 1862. He arrived at Hampton Roads on the evening of the 8th, after the iron-clad "Merrimac" had destroyed the wooden frigates "Cumberland" and "Congress." On the morning of the 9th a memorable battle was fought by the "Merrimac" and "Monitor," the former of which was partly disabled and abandoned the fight, after several violent collisions with the "Monitor." He was promoted commander in 1862, captain in 1863; and commanded the iron-clad "Montauk" in the operations against Fort Sumter in April of that year. In June, 1868, he was promoted commodore, and in 1872 rear-admiral. He was superintendent of the Naval Academy at Annapolis in 1870-1874; commander-in-chief of the European squadron in 1875-1877; and was retired, at his own request, with full sea pay, Dec. 23, 1886. He died in Washington, D. C., Oct. 18, 1897.

WORDSWORTH, WILLIAM, an English poet; born in Cockermouth, Cumberland, April 7, 1770. He was the son of an attorney and in 1787 was sent to St. John's College, Cambridge. He left the university after taking his degree, but without having otherwise distinguished himself, and lived aimlessly in London and elsewhere. He crossed to France in November, 1791, and exhibited vehement sympathy with the revolution, remaining in France for nearly a year. After his return, disregarding all entreaties to enter on a professional career, he published his "Evening Walk and Descriptive Sketches" (1793). Two years afterward he received a legacy of $4,500 from Raisley Calvert, a friend whom he had nursed in his last illness. With this sum and the consecrated helpfulness of his sister Dorothy he contrived to keep house for eight years, while he gave himself to poetic effort as his high "office on earth." For the first two years they lived at Racedown in Dorset where the poet among other experiments began his tragedy of "The Borderers." In this retreat they were visited (1797) by Coleridge, who had already recognized an original poetic genius in the author of "Descriptive Sketches." Coleridge was at this time living at Nether Stowey, in Somerset, and during this visit he induced the Wordsworths to go into residence at Alfoxden, in his immediate neighborhood. Here the two poets held daily intercourse, and after a year they published "Lyrical Ballads" (1798) in literary copartnership.

Though this volume was received with almost complete public indifference, yet Wordsworth felt that he had found his mission, and after a winter spent in Germany, he and his sister settled at Grasmere (1799), where he proposed to write a great philosophical poem on man, nature, and society. Thenceforth his life was marked by a few incidents. Those worth noting are his marriage in 1802 with his cousin Mary Hutchison; a removal from Grasmere to Allan Bank in 1808; his appointment in 1818 to an inspectorship of stamps, and his removal to Rydal Mount; several journeys into Scotland and to the Continent; his acceptance of a D. C. L. degree conferred on him in 1839 by the University of Oxford; and his accession in 1843 to the laureateship on the death of Southey. Wordsworth's great philosophic poem, which, in his own phrase, was to be the Gothic cathedral of his labor, received only a fragmentary accomplishment in "The Prelude," "The Excursion," and "The Recluse." Yet enough was achieved in his smaller poems to justify his own conception of himself as a "dedicated spirit," and to set him apart among the greatest of England's poets. A complete edition of his poetical works has been published by Professor Knight, his prose writings have been collected and published by Dr. Grossart, his "Memoirs" were published in 1851 by his nephew, and an interesting account of the poet and his sister Dorothy is found in her "Diary of a Tour of the Highlands." He died in Rydal Mount, April 23, 1850.

WORKINGMEN'S COMPENSATION, a system of compensation for accidents in the course of employment doing away with the delays, costs, and obstacles which brought hardship to the injured workers. Under the employers' liability laws a workingman who had suffered an accident was required to bring suit at law and break down the objections put forward by his employer before he could secure damage for his injury. These laws surrounded the employer with defenses so that the injured worker had

to make it clear that he was not himself responsible for the injury sustained, that no fellow worker had been at fault, and that the accident partook of a character which put it outside the normal risks connected with the industry. It thus came about that a small proportion only of the injuries suffered were ever compensated, and the injuries had to be borne with as best they could be. Legislation in the direction of securing compensation for the injured worker had long been the subject of consideration and discussion in European countries, and legislation having that purpose in view was introduced in Germany in 1884. The new laws, which were made the model of laws having a similar purpose in other European countries, also attracted attention in the United States, where a number of States passed legislation on similar lines. This legislation had the effect in most cases of doing away with the necessity of a lawsuit, and of providing scales of compensation for injuries during working hours and connected with the work regardless as to the direction in which responsibility lay. These laws in most cases required that accidents of every kind should be reported to a public board having the duty of determining the amounts of compensation. The injured worker or his family are thus enabled to receive their due without expense or delay.

WORKINGTON, a municipal borough and seaport of Cumberland, England, at the mouth of the Derwent; 7 miles N. of Whitehaven. Its harbor, furnished with a breakwater (1873) and several quays, is safe and commodious. To the coal mines in the vicinity the town chiefly owes its prosperity; and there are large iron works and other industrial establishments here. The salmon fishery near is important. Mary, Queen of Scots, landed here, on her flight from Langside, May 16, 1568, and was entertained at Worthington Hall (the seat of the Curwens from about 1160 till the present day). Pop. about 25,000.

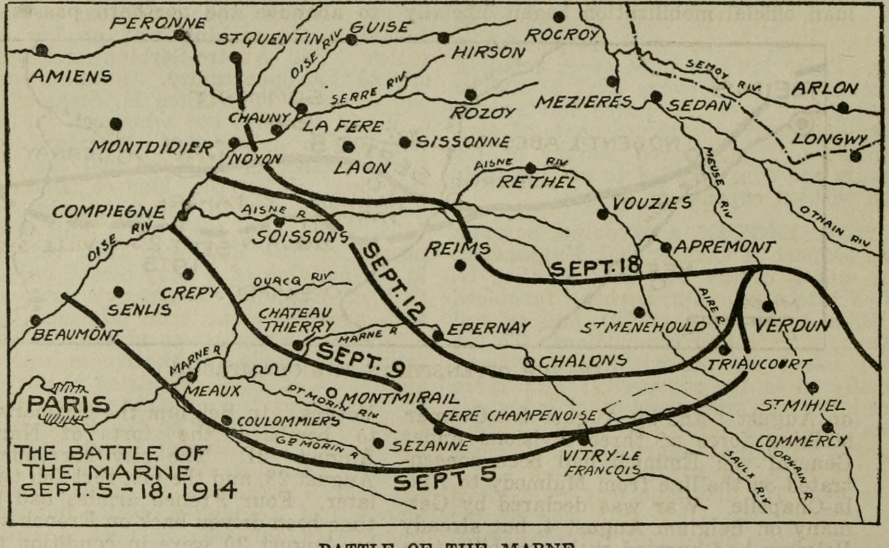
WORLD WAR, the war fought between Serbia, Russia, France, Belgium, England, Japan, Italy, the United States and their allies (generally termed the *Allies*), and Austria-Hungary, Germany, Bulgaria, and Turkey (known as the *Central Powers*). It began on July 28, 1914, with Austria-Hungary's declaration of war on Serbia, and ended on November 11, 1918, with the granting of an armistice to Germany on the part of the Allies.

The Deeper Causes, Efforts for Peace. —The assassination of the Archduke Francis Ferdinand, heir to the Austrian throne, and his consort at Sarajevo, capital of Bosnia, on June 28, 1914, precipitated the World War but it was not the cause. The million Slavs of Serbian race in Austria-Hungary had long aspired to unite with their brothers in Serbia in the formation of a great Serbian Empire, and in this purpose they were encouraged by the government of Belgrade. Austria recognized the menace that threatened the disruption of the Empire, and in 1913 had sounded Italy on the question of striking a decisive blow at Serbia, but met with no encouragement. The Dual Monarchy, assured of Germany's support, only waited for a favorable opportunity to attack Serbia.

The crime of Sarajevo provided a cause for making war, for demands were made on the little kingdom which no sovereign state could honorably accept. Germany shared with her ally the fear of a great Slavic union and there were other scores to be settled when she was strong enough and conditions seemed favorable for making war on her enemies. The Austro-Serbian embroglio offered that opportunity. Germany since the accession of William II. dreamed of a World Empire, but wherever she attempted to extend her dominions she found France or England had been before her, while the Monroe Doctrine blocked her way in South America. In 1906, 1908, and 1912 navy bills were passed by the Reichstag that resulted in the building of a navy second only to that of England. Germany's arrogant and aggressive attitude alarmed her neighbors. France was already in alliance with Russia and the Anglo-Russian agreement of 1907 completed the triple understanding. For eight years Germany tried to break up the Entente by alternately threatening and making friendly advances. Austria annexed Bosnia and Herzegovina in 1908. Russia, France and England protested but were unprepared for war in such a cause. Germany supporting Austria waved her shining sword and treated the protest with contempt, but the Entente survived the blow firm and unimpaired. In 1908 Germany despatched the "Panther" to Agadir, a direct provocation to France, but Great Britain's support averted war and Germany was pacified by the cession of a portion of the French Congo. Other disappointments for Germany followed. The Italian annexation of Tripoli and Cyrenaica after the war of 1911 ended German hopes in these territories. She believed that Turkey would win in the Balkan War that followed, but the result was that a new and formidable Slav

power now stood in the way of her peaceful absorption of the Ottoman Empire, while Russian protection of Slav nations became an increasing and powerful menace. Germany had become the greatest military power on earth, with a peace strength of 870,000 men. The growth of socialism threatened the monarchy. The Military party backed by monarchists, junkers, and agrarians believed that the hour was at hand when Germany could measure strength with her enemies and become the World Empire that for three decades had been the dream of the governing class.

Through servile professors and a subsidized press the people were educated to share the same view. On July 25 Austria presented a note to Serbia the complete acceptance of which would have forced Serbia to resign her independent nationality and rights as a sovereign state. Serbia agreed to fulfill all demands but two, which she offered to submit to The Hague Conference. Austria insisted on complete acceptance and being refused, her minister at Belgrade left on the following day. Sir Edward Grey suggested to Germany, France and Italy the calling of a conference to mediate in the quarrel. Germany alone declined on the ground that Russia and Austria were then trying to settle the difficulty. On July 28, Austria declared war on Serbia and bombarded Belgrade; Belgium mobilized; Germany recalled her High Sea Fleet and Britain assembled her naval forces. Following Austria's invasion of Serbia, Russia mobilized her southern commands. Germany now made a bid for British neutrality, promising that no territorial acquisition would be made at the expense of France should she prove victorious in war. The German Government however, would make no such promises regarding French colonies. As regards Belgium the integrity of the kingdom would be respected after the war provided she had not sided against Germany. On July 30, Sir Edward Grey rejected Germany's offer to secure Britain's neutrality and proposed a new Council of Europe to consider the crisis. On July 31, Germany issued an ultimatum to Russia demanding immediate demobilization. Sir Edward Grey asked Germany and France if they would respect Belgium's neutrality provided no other nation attempted to violate it. France agreed at once, but Germany was silent. Telegrams passed between Kaiser, Czar and British king, but Germany declined all attempts to avert the crisis. In the evening of Saturday, August 1, Germany declared war on Russia. On August 3, Sir Edward Grey in the House of Commons described the situation. Britain was bound by treaty obligations to protect the neutrality of Belgium. On the same date King Albert asked for help. Britain was not bound to France by any offensive or defensive alliance, but had given France the assurance that if the German fleet attacked her coasts, or shipping, the British fleet would act. Germany had demanded a free passage through Belgium for her armies, and

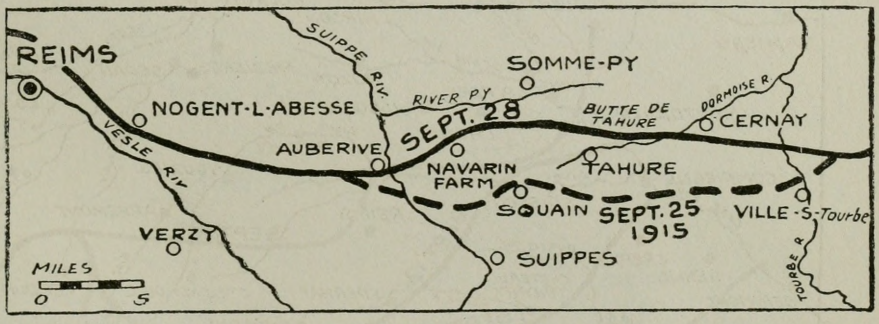


BATTLE OF THE MARNE

Belgium refused categorically. The British ambassador at Berlin was instructed to ask the German Government if Belgium's neutrality would be respected. At 7 p. m. August 4, Sir Edward Goschen was handed his passports; Germany and Great Britain were at war.

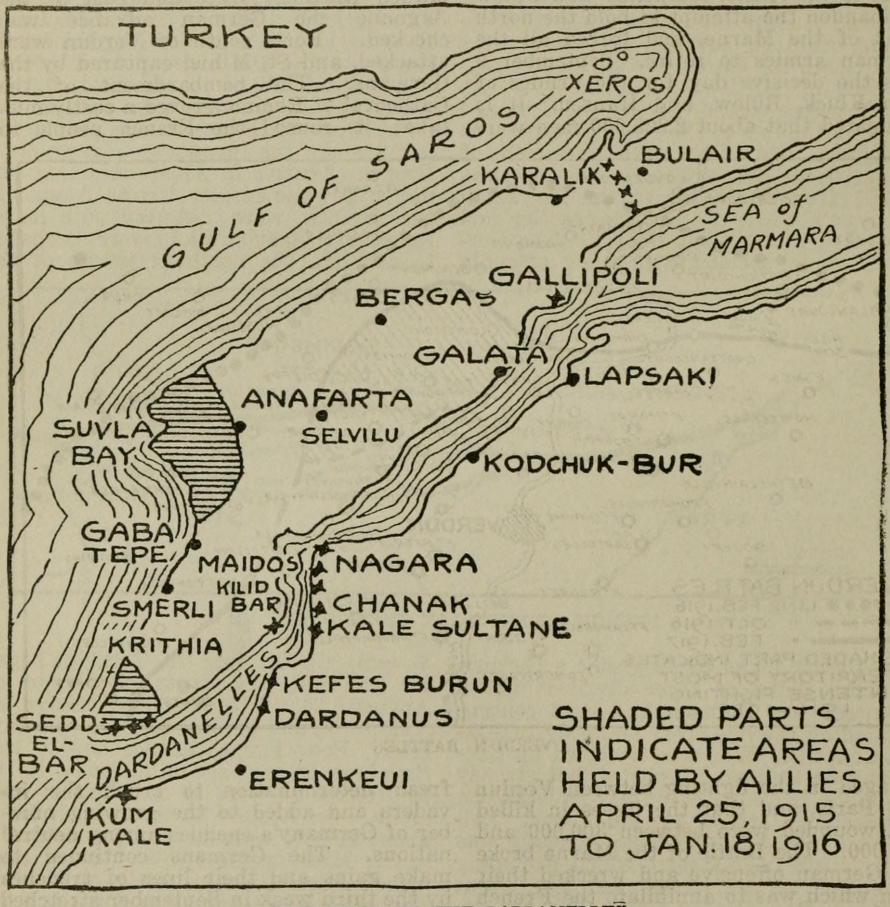
1914

The Western Front.—The first act of war was committed on August 2, when German officers and men invaded the Grand Duchy of Luxemburg and demanded passage for the German army. Beyond making a formal protest the little state could do nothing, and before the day closed the Germans were in full possession of all roads and railways. At other points on the frontier the Germans crossed the line to the French fortress at Longwy, and from the direction of Strassburg drove across the Vosges, while from Mulhouse in the far south cavalry crossed the French frontier and attacked the customs guards. The German official mobilization began officially on August 1 and by August 4 a German striking force of three divisions under General von Emmich had been concentrated on the line from Malmedy to Aix-la-Chapelle. War was declared by Germany on Belgium August 4, but already Belgium had hurried on her mobilization assembling troops around Liège. Belgium's total available army strength was only about 265,000 men, which, excluding the fortress garrisons, left her about 134,000 men for the field. For the defense of Liège an army of about 20,000 men under General Leman had been concentrated to oppose the German advance. Belgians and Germans first clashed in the afternoon of August 4. An artillery duel continued through the night. The southeastern forts were silenced and the Germans entered Liège on August 7. The northern forts still held out, and General Leman withdrew his troops to the north. On August 7 a French brigade made a dash into Alsace. This was accomplished almost without opposition, but on August 10, when the Germans had been re-enforced the French were forced to withdraw. On August 4, a state of war with Germany was officially declared by Great Britain; the army having mobilized the previous day. On August 6 the House of Commons sanctioned an increase of the army by 500,000 men. The expeditionary forces consisting of four divisions and a division of cavalry began embarkation on August 7 and within ten days were safely landed at various French ports. The German advance in Belgium had been arrested by the northern forts and the brave defense offered by Belgian troops in the field, but by August 17 all the forts were silenced and on August 20 Brussels was peacefully occupied by the invaders. Meanwhile a French offensive in Alsace and Lorraine met with some success, but on August 21 the French were defeated with heavy losses near Saarburg and were compelled to abandon the northern passes of the Vosges. In Belgium the Germans began to bombard the forts of Namur on August 21. The city surrendered on August 23, and the last fort fell two days later. Four French armies had by this time been driven back on French soil, but by August 30 were in condition to fight again. On August 23 the British force, about 80,000, were in position behind a canal; Mons in the center, joining Lanrezac's French armies north of Sambre. The Allies had seven army corps and the Germans thirteen. The French defeat at Charleroi on August 22 by overwhelming numbers placed the British army in peril and immediate retreat was imperative, yet two days passed before a start was made. For five days following the British marched day and night, fighting a hand battle at Le Cateau and many minor engagements, and finally reaching the Oise river, depleted in numbers but still an army. The French armies in



FRENCH OFFENSIVE IN THE CHAMPAGNE

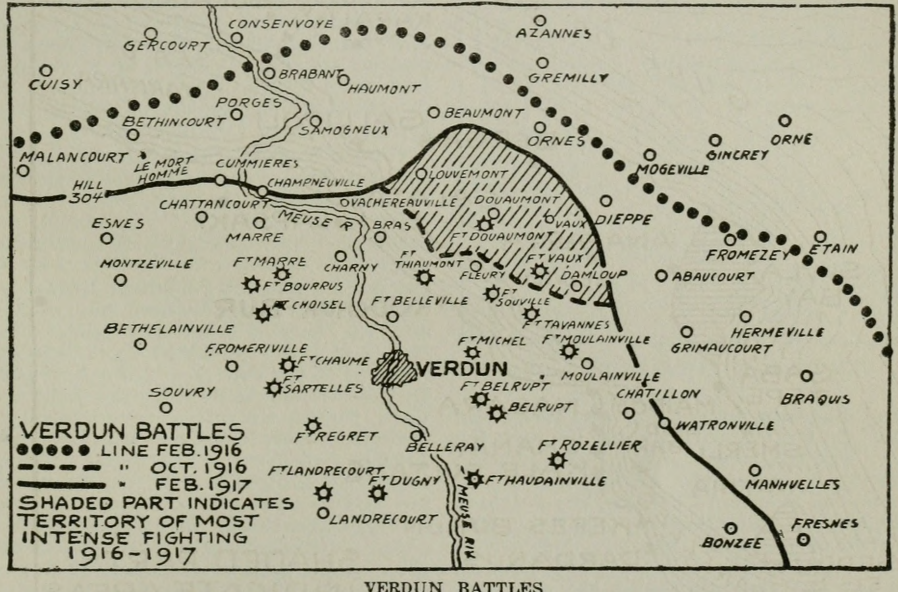
their retreat, having more troops, were better able to fight off attacks made by the enemy and suffered less in the retreat and by August 30 were again in good fighting condition. On the line of the Somme, the Oise, and the Aisne from Amiens to Verdun, the French were ready for battle. The British, however, had not yet recovered from their disastrous retreat and therefore Joffre's armies continued to fall back to the south of Paris until September 4. Von Kluck, the German commander, believing Germans while another French army from the north threatened to flank the German positions. Von Kluck appreciating his peril, and leaving only a cavalry regiment to hold the British, counter-attacked, and September 8-9 drove Manoury back and so endangered the northern flank of the French army that it seemed Manoury would be forced to retire on Paris. On the night of September 9 the Paris garrison stood to arms, and Manoury's troops awaited daybreak, expecting a crushing defeat, but by



WAR ZONE AT THE DARDANELLES

that he had to deal with beaten forces, but still formidable, had one objective; to smash the French before attempting an attack on Paris. He marched southeast to attack the French flank. In the Battle of the Ourcq which began September 5, Manoury's army first encountered Germans among the hills of Monthyon and Penchard and on the following day in the valley of the Ourcq defeated the morning the Germans had begun their retreat to the Aisne. Manoury's attack in the Ourcq battle had dislocated Von Kluck's army, and forced von Bülow to the east to draw back to keep in line with Von Kluck, heavily hammered by the French who pursued. To the east Foch held the French center, and there the Germans struck with force driving the French south so far, especially on the

eastern flank, that a wide gap was created in the whole French line. D'Espery's corps east of the gap, his 10th division freed by Von Bülow's withdrawal, left his division to Foch, who launched a terrific attack on the Prussian Guard, holding position between the Marshes of St. Gond and La Fère Champenoise. The Germans were routed, losing most of their artillery; the Saxon regiments were smashed, and the whole army of Hausen scattered. News of this disaster started Von Kluck in rapid retreat to the Aisne, compelled Von Bülow to abandon the attempt to hold the north bank of the Marne, and forced all the German armies to retire. September 9 was the decisive day for the armies of Von Kluck, Bülow, and Hausen. It is estimated that about 2,225,000 men were Marne possible. This struggle, which the Germans lost, became known as the second battle of Nancy and saved the eastern barrier of France. The Germans after the Marne retreat dug themselves in behind the Aisne and by September 18 had assumed the offensive, driving back French and British to the north of the river. To the east the German line now swept around Rheims and through the Argonne. In the third week of September Foch was held up at Rheims by Bülow who captured several forts and bombarded Rheims. West and east of the Argonne the German advance was checked. Forts south of Verdun were attacked, and St. Mihiel captured by the Germans. The bombardment of the Cathedral of Rheims proved a costly mistake; it roused the French people to



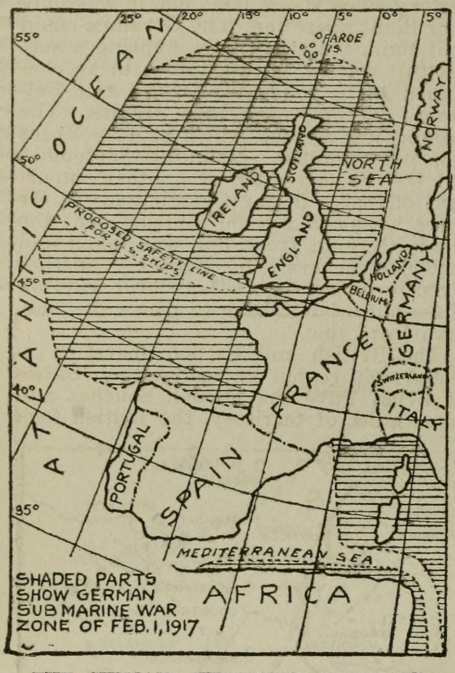
VERDUN BATTLES

engaged in the fighting between Verdun and Paris, and that the losses in killed and wounded were between 300,000 and 350,000. The Battle of the Marne broke the German offensive and wrecked their plan which was to annihilate the French armies in the first six weeks of the war.

During the first week of September, and before the battle of the Marne had been decided eight German corps attempted to cut their way through the French barrier forts between Toul and Epinal which would bring them to the flank and rear of all the French armies engaged from Verdun to Paris, but the army of General de Castelnau repulsed all attacks and made the victory of the fresh determination to crush the invaders and added to the growing number of Germany's enemies among neutral nations. The Germans continued to make gains and their lines of trenches by the third week in September stretched from the Vosges to the Oise. The French flanking operations west of this river were defeated and the Germans recaptured Peronne, Roye, and Lassigny.

Late in September there was only a gap of forty miles between the French lines from Lille southward and the Channel. The Germans now had two definite aims, to capture Antwerp and the Belgian army, occupy the Channel ports and regain the initiative. Ant-

werp was bombarded on September 29 and surrendered October 8, the Belgian army escaping. Ostend fell on October 15 and the Germans now held most of the Belgian coast. Late in October between La Bassée and the sea British, French,



THE GERMAN SUBMARINE BLOCKADE

and Belgians fought for six weeks and held up the German advance between the Lys and the mouth of the Yser. At the battle of Ypres the British lost 50,000 men, the French 70,000, and the Belgians 20,000, but the Allies won the fight. The battle of the Yser, not less destructive, was won by the Belgians and French. When the struggle ended the Germans had gained some strips of shell-torn territory, but the main line of the Allies stood and the German attempt to gain Dunkirk and Calais had been frustrated. Germany now occupied most of the industrial regions of France and all but a small strip of Belgium. She had failed to destroy France, the British army was growing, a quick victory could no longer be counted on and meanwhile the Russians were invading the Carpathians.

From the day that a state of war was declared to exist between Britain and Germany, the British Fleet under John Jellicoe disappeared to find a safe retreat among the Orkneys, there to wait its chance to strike. At the outbreak of the war two German warships, the "Goeben" and "Breslau" were off the Algerian coast. They succeeded in evading their pursuers and gained Constantinople, where they passed into the possession of the Turkish Government. The first naval engagement between German and British ships was fought in Helgoland Bight, August 28, resulting in the destruction of three German light cruisers and several destroyers with no British loss.

The Eastern Front.—Austria declared war on Serbia on July 28, on which date Belgrade was bombarded. An Austrian attempt to cross the Danube on August 6 was repulsed with heavy losses. Antivari, Montenegro's only seaport, was bombarded by the Austrian fleet on the following day. Serbian and Montenegrin forces invaded Bosnia on August 12. The most serious fighting was at Shabatz, which the Austrians won on August 16. They were driven out the next two days and by August 23 the Serbians had cleared the enemy from their country. December 2 the Austrians captured Belgrade after four months' effort, but were forced to retire December 14.

On the Russian front a Russian army invaded East Prussia in the first week of August, and August 16-20 won an important victory at Gumbinnen, and occupied Tilsit. Ruzsky's Second Army meanwhile defeated the Austrians at Sokal and on August 23 joined Brussilov's Third Army and advanced on Lemberg and the Second Austrian Army. The Battle of Lemberg lasted eight days and resulted in the collapse of the Austrians. In the subsequent fighting the Austrians were forced to retreat over the Carpathian passes, leaving in Russian hands 250,000 prisoners. The result was the loss of all Galicia to the San, the investing of Przemysl and a Cossack invasion of the Carpathians and the Hungarian plain. Hindenburg's prompt action saved the armies of the Central Powers from retreat and rout. By August 14 the Hindenburg armies had reached the outskirts of Warsaw and the attack on the city began. The arrival of eight Russian army corps led to a week's struggle and forced Hindenburg to retreat on October 21. The Russians had invested Przemysl and were moving on Cracow. Hindenburg was now forced to make an effort to save the Austrians in Galicia. Leaving a force of Austrians to deal with the Russians on the front from Cracow to Kalisz, he turned the Russian flank and moved his armies between the Russians and Warsaw. The Russian position was desperate, for their northern flank had been turned and they were attacked in front by more Germans and Austrians advancing north from

Cracow who threatened their southern flank. But the Russians, gathering troops from Warsaw, East Prussia and fortress garrisons, struck the enemy's northern flank and the Germans with difficulty fought their way out. A German attempt to capture Warsaw failed in January.

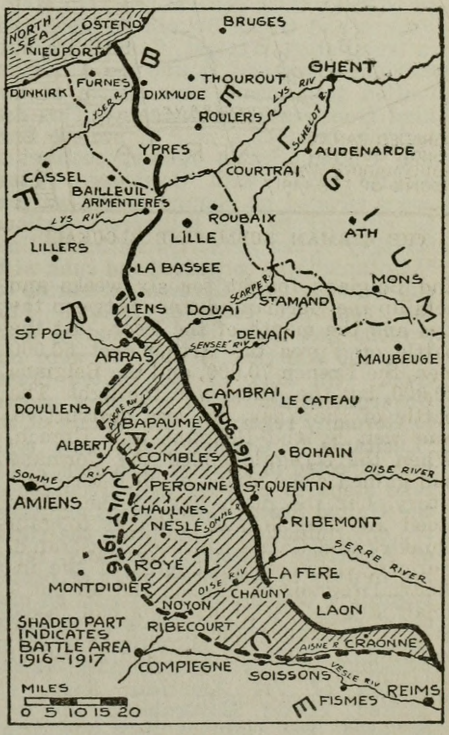
Other important events during the closing months of 1914 were Turkey's declaration of war against the Allies in October and the proclamation of a Holy War against England, France, and Russia. In December the short-lived South African rebellion led by De Wet was crushed by the capture of the leader and the most of his army. On the sea the defeat of Admiral Craddock and the loss of three British ships off the coast of Chili, November 1. Craddock was avenged December 8 when Vice-Admiral Sturdee sank four German battleships in the South Atlantic near the Falkland Islands, only one ship, the "Dresden," escaping. On December 18 the British deposed the Khedive of Egypt, Abbas Milmi Pasha and appointed his uncle, Hussein Kemal Pasha with the title of Sultan to the throne of Egypt.

1915

Western Front, Etc. — In northern France the Germans took the offensive in January, 1915, northeast of Soissons, forcing back the French line to the southern bank of the Aisne. In February the French started a great offensive in the Champagne, between Rheims and the Argonne, which raged for weeks and yet brought the French victors only meager gains. But the Germans, forced to strip their front to repel this attack, afforded the British early in March a chance to strike and win Neuve Chapelle. In April the French again assumed the offensive, driving at the Germans between the Meuse and the Moselle. The German position known as the St. Mihiel "wedge" had been gained by them the previous September, when a German army reduced the Fort des Romains, ocupied St. Mihiel and fortified the territory around.

The struggle won some ground for the French, but the Germans still held their main positions from the Meuse to the Moselle. In the last days of April the Germans made a powerful drive at the Allied front between the Lys and the North Sea. This broke for a time the French lines between the Belgians and British and forced them back on Ypres. The Germans made gains, but the Allies reorganized and eventually the offensive quieted down. In the second week in May, General Joffre attacked between Arras and La Bassé on a twenty-five mile front, the objective being the coal city of Lens. The French won line after line of trenches, captured Loos, and north of Arras pushed east, making gains of between three and four miles. This was the most important French victory since the Marne, but it was only a brilliant operation. The Germans could still claim that they were fighting a successful war in France. Attacks continued to be made in France and Belgium without important results. The ground lost by the Allies around Ypres was not regained. Not until September did the French attempt another important offensive in the Champagne. After three weeks of terrific bombardment the whole German front line was taken and 20,000 prisoners. On October 7 another French attack was launched, gaining three miles but failing to pierce the German third line.

The British and French operation in the Artois region known as the "Battle of Lens" gave the French Souchez and some miles of territory, the British took



SOMME BATTLE ZONE

5,000 prisoners and advanced three miles at some points when they were halted by the Germans, who still held possession of Lens.

German merchant ships had disappeared from the seven seas by the beginning of 1915, but her submarines continued to sink British and French ships. An action was fought January 24. Off the Dogger Bank, a number of German ships on their way to bombard the British coast were intercepted by Vice-Admiral Beatty who sank the armored cruiser "Blücher" and damaged two other German battle-cruisers. The remaining German ships escaped to home waters. On February 10 the United States Government addressed a warning note to Germany against the destruction of merchantships without determining their belligerent nationality, or the contraband character of their cargoes. A note was also addressed to Great Britain protesting against the use of the American flag on British vessels. Germany replied by disclaiming all responsibility for such accidents and their consequences as a result to neutral vessels. Britain upheld the use of neutral flags in war, but declared the government had no intention of advising their general use. On May 1 France and Great Britain declared that in retaliation against Germany's submarine "blockade," it was the Allies' intention to prevent commodities of any kind from reaching Germany. This declaration brought a note of protest from the United States against cutting off neutral trade with Germany. These notes effected no change in sea-warfare as pursued by the belligerent nations. On May 7, the great transatlantic liner "Lusitania" was torpedoed and sunk without warning by a German submarine off the southern coast of Ireland. 1150 persons lost their lives (including more than 100 Americans) and 767 were rescued. On May 13 the United States Government addressed a note of protest to Germany regarding the sinking of the "Lusitania." Germany, the note read, was expected to disavow such acts, and to take steps to prevent their recurrence; the United States Government expressed the determination to maintain the rights of American citizens. Germany, replying in July to American notes of protest regarding the submarine attacks on merchant shipping, pledged safety for United States shipping by allowing four enemy passenger steamers to sail under the protection of the American flag. The United States Government in reply declared the German note unsatisfactory, and stated that the repetition of incidents complained of would be regarded as "deliberately unfriendly." Other notes followed, between the United States and Germany without causing any changes in the situation. Great Britain replying to the charge that she was interfering with American trade in the war-zone maintained that she was adhering to the principles of international law as modified by modern conditions. Germany continued to sink American ships, but on September 23 declared that in the future American vessels carrying conditional contraband would not be destroyed. A note apologetic in tone for the sinking of the "Arabic" followed in October.

The Eastern Front and Elsewhere.— The Russian army in Galicia began a second invasion of Hungary in the first week of January, 1915. This was followed by a new drive into East Prussia. The Russians defeated the Turks in the Caucasus and occupied Tabriz, Persia. Between March 19, and April 5 the Russians won the principal chain of the Carpathians on a 75-mile front and took 70,000 Austrian prisoners. Their advance in East Prussia was quickly checked and led to a heavy defeat. May 2, Austrian and German troops forced back the entire Russian army in Galicia, and in June the Austrian stronghold Przemysl was recaptured; a territory as large as Belgium was reclaimed, Lemberg fell, and in the first week of August, German troops occupied Warsaw. Brest-Litovsk, the most important fortress in Russia's second line of defense was captured by the Germans in the last week in August. Grodno and Vilna fell to German arms in September.

A Turkish attempt on the Suez Canal January 27 was defeated by British and Egyptian forces guarding the waterway and another attempt in February to the north of Suez was also a failure. On February 19-20 a fleet of French and British warships bombarded the Turkish forts at the entrance to the Dardanelles. The forts were reduced during the month, but the Allies lost during the operation three great battleships. A landing of Allied troops on the Gallipoli Peninsula was carried out under cover of the guns of the fleet, with a loss of 15,000 men. For the remainder of the year the Gallipoli campaign was vigorously pressed, but the result was failure, and on December 15 the Allies began a general retirement on land and sea.

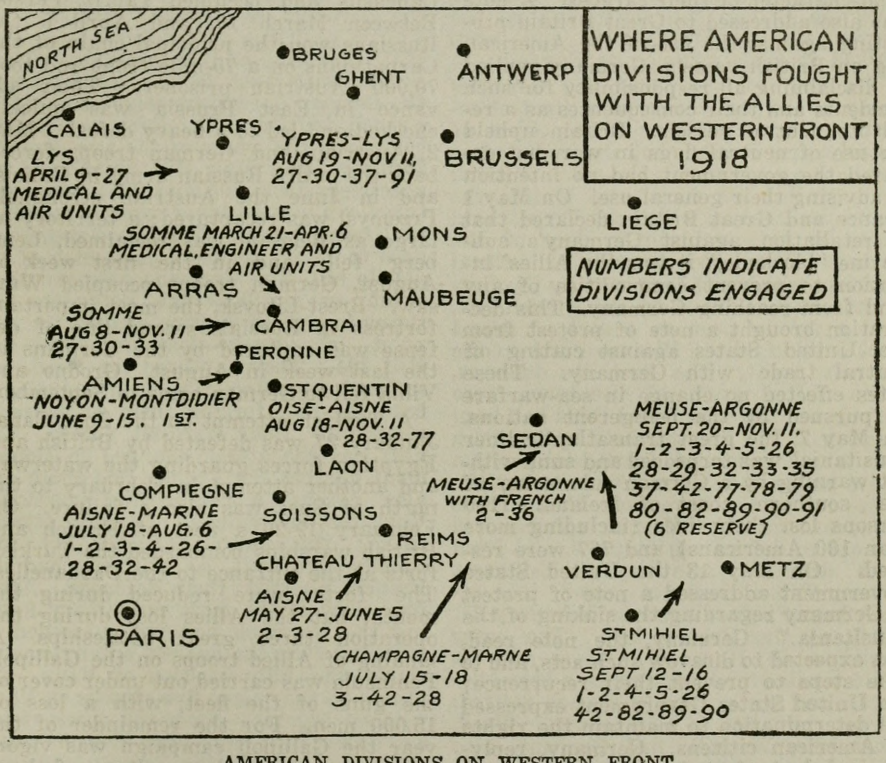
On May 24, Italy declared war against Austria-Hungary and the following day Italian troops crossed the border and in June occupied Monfalcone and important positions. On July 9, in South Africa, General Botha, commanding British colonial troops, received the surrender of all German forces in German Southwest Africa. Bulgarian mobilization was followed in Greece on September 23, by orders for a general mobilization of all

Greek forces. Bulgaria's reply to the Allies' note concerning her warlike preparations having proved unsatisfactory, on October 6 the Ministers representing France, England and Italy at Sofia asked for their passports. Serbia was invaded by a great Austro-German army October 7, in an attempt to open up a route to Constantinople to aid the Turks. The Serbians drove the invaders' right wing across the Danube, crushed their left wing, but were unable to save Belgrade, which was occupied by the enemy. Bulgaria entered the war as an ally of the Central Powers and Turkey on October 11, and invaded Serbia at several points. The Greek Government declining to fulfill their treaty with Serbia (a defensive alliance); the French troops landed at Salonica to act against Bulgaria, encouraged to do so by Ex-Premier Venizelos of Greece who was eager to have his country join the Allies. The bulk of the Greek people favored the Entente, but the disaster at the Dardanelles and the fate of Serbia now over-run by Austrians, Germans, and Bulgarians caused King Constantine to adopt a neutral attitude which favored the Central Powers.

The attempt made by the French and British to help Serbia had come too late, owing to the time wasted in parleys with Bulgaria.

The Franco-British force, while inflicting heavy losses on the Bulgars, could not save Serbia, her army retired before the enemy, and practically all her people went into exile. The remainder of the army was shipped by the Allies to Corfu where it was reorganized.

The Anglo-Indian expeditionary force which invaded Mesopotamia and which achieved a victory over the Turks near the Persian Gulf, and later in an advance toward Bagdad, met with a succession of disasters which forced the British commander General Townshend to retire to the Arab river town of Kut-el-Amara where he was besieged by Turks and Arabs.



AMERICAN DIVISIONS ON WESTERN FRONT

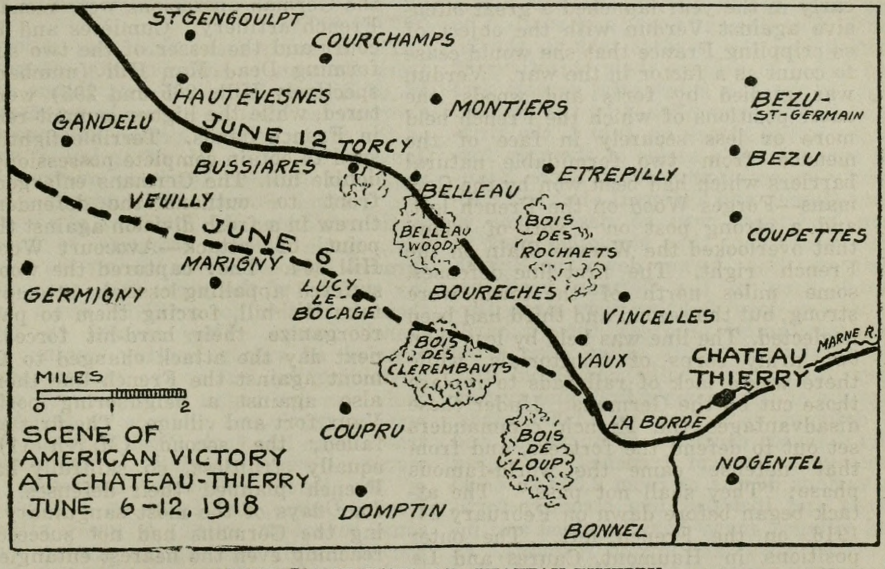
1916

The year 1916 did not open very propitiously for the Allies in the land campaigns except in Africa, where all but one of the German colonies had been captured. At sea they had maintained their supremacy—which was further sustained by the outcome of the Jutland battle

later described—and continued to throttle Germany's sea-borne trade with their naval cordon. The credit side of the Allies' record was also augmented by the fact that their armies were still in being, and adding to their strength, except Serbia's. On the other hand there was a disquieting situation on most of the war fronts. In the west only a few miles had been recovered from the Germans and at a heavy cost. On the Russian front and in the Balkans the situation was worse. Nearly all Galicia and Poland and Courland had fallen to the Germans, and the Serbian army had virtually been wiped out. On the adjacent front—the Austro-Italian line—Italy had made little headway. Further east the British had failed against the Turks in the Dardanelles and were balked in their advance on Bagdad.

On the western front the Germans early in the year launched a great offensive against Verdun with the object of so crippling France that she would cease to count as a factor in the war. Verdun was girdled by forts and woods, the outer positions of which the French held more or less securely in face of the menace from two formidable natural barriers which had been won by the Germans—Forges Wood on the French left, and a strong post on a sort of island that overlooked the Woevre Plain on the French right. The first line defenses, some miles north of the town, were strong, but the second and third had been neglected. The line was held by less than two army corps of territorials, while there was a lack of railroads to replace those cut by the Germans. Under these disadvantages the French commanders set out to defend the fortress, and from that defense came the world-famous phase: "They shall not pass." The attack began before dawn on February 21, 1916, on the French left. The outer positions in Haumont, Caures and La Ville woods crumbled, despite a brave defense, and the surviving French retired. Other outposts — Consenvoye Wood, Herbebois, Wayrille and Brabant—also fell to the assailants. On February 24 the German advance broke through the French resistance round Fosses Wood, Beaumont, Le Chaume Wood and Les Chamrettes. The French situation thus became serious by the loss of a group of outposts that jeopardized the retention of the inner positions, on to which the Germans advanced. The latter, however, were temporarily checked by French counterattacks after the fighting had continued without cessation for four days and nights. Louvemont fell, and then the Germans turned their attention to Douaumont fort and village, the next point in the line of attack on the outer rim of the old permanent fortifications. On February 27 the struggle there was marked by ruthless hand-to-hand fighting and bayonet charges, which forced the Germans to retreat with heavy losses. A renewed attempt had the same result; then came a two day's respite. On March 2 the Germans returned to the attack with an avalanche of shells and advanced in almost solid formation. They succeeded, despite the French defense, in entering Douaumont, only to be ousted the following night, but the next morning they recovered it by bringing heavy re-enforcements. To even the line reached by the possession of Douaumont, the Germans, on March 6, attacked the French positions on the left—Dead Man Hill, Cumières and Bethincourt. These points were west of the Meuse, where the German operations were menaced by French artillery. Cumières and Bethincourt and the lesser of the two summits forming Dead Man Hill (numbered respectively Hills 265 and 295) were captured, while the higher summit remained in French hands. Terrible fighting ensued to obtain complete possession of the double hill. The Germans enlarged their front to outflank the defenders and threw in a fresh division against the new point of attack—Avocourt Wood and Hill 304. They captured the wood, but suffered appalling losses in attempting to take the hill, forcing them to pause to reorganize their hard-hit forces. The next day the attack changed to Douaumont against the French line there and also against a neighboring position—Vaux fort and village. The first attacks failed; the second (March 11) was equally fruitless, so skilfully had the French planned their defenses. After four days of the most sanguinary fighting the Germans had not succeeded in reaching even the nearest entanglements round the hilly position of Vaux. On March 16 they made five attacks on Vaux without breaking down the sorely tried defenders; two days later they attacked six times, and still the French held their ground. It was not until March 31 that they succeeded in occupying the western end of Vaux village, the overlooking fort remaining in French hands. Meantime (March 20) the Germans returned to their outflanking operations to obtain Dead Man Hill on the northwest. The struggle for this hill and Hill 304 developed into one of the most notable battles in the defense of Verdun. The battles round Douaumont and Vaux were also remarkable for the tenacity of purpose of both sides. At the beginning of May,

after two months' fighting, the Germans had not got beyond Douaumont and Vaux on the right, while the French line on the left remained fixed on part of Dead Man Hill and the adjacent elevation, Hill 304. The German determination, however, to take these positions was not weakened, and during May they put forth their utmost strength to break the French resistance at both ends. Renewed attacks forced the French to yield parts of both hills. On the Douaumont and Vaux line the Germans also resumed their attacks to complete their possession of Vaux, where the French occupied near-by slopes that commanded the village, which was held by the Germans and consisted of a single street. The French on their part were bent on recovering Douaumont fort, which they penetrated on May 22. They held it for two days, back to the extreme edge of the hills. A number of points next in line toward Verdun from Douaumont and Vaux—Thiaumont, Fleury, Chapitre Wood and Fumin—were savagely attacked on June 23. Fleury was a pivotal point for capturing the fortress of Souville, about three miles from Verdun. The struggle for Thiaumont continued for several days; the place changed hands frequently, and on July 4 was finally held by the Germans, who also gained a footing in Chapitre Wood. The French were now just holding the inside line of Verdun forts—Belleville, Souville and Tavannes—with their backs to the river and with German trenches approaching right up to the ditches of these forts. In other words, the French were about in their last ditch before Verdun. Then the great Allied offensive on the



AMERICAN VICTORY AT CHATEAU-THIERRY

bitter fighting at close quarters meantime taking place within its walls before they were ousted by Bavarian re-enforcements. With June came an eight-day battle for the Vaux slopes. The strain became too terrible for the French garrison to endure, and the brave remnant finally were surrounded and yielded the position. The Germans were now in contact with the inner defenses of Verdun, and the war situation elsewhere demanded that the crushing blow to France be delivered without delay. They had pushed out from Douaumont and captured Vaux, had crowded up and over Dead Man Hill and up the slope of Hill 304, forcing the French Somme intervened, and the Germans gained nothing more in their final attempt to reach the city. On July 12 they were halted by the French on the Fleury and Souville road and four days later the struggle for Verdun ceased. The development of Allied operations on the Somme compelled the Germans to make that sector their principal preoccupation on the western front. A long strip of the outer defenses of Verdun, averaging three miles in breadth north and northeast, fell to the attackers; some three miles to the south from the nearest points reached by the Germans lay the beleaguered city, shell torn but safe. In a five-months' combat 3,000 cannon and

about two million men had defended or attacked the stronghold, and it was estimated that the losses on both sides exceeded 200,000. The French, to whom the initiative had passed, by nibbling methods began to recover their lost positions and recaptured forts Douaumont and Vaux among other points.

The Somme offensive had been undertaken to relieve the pressure on Verdun, as well as to prevent the transference of large bodies of troops from the west to the eastern front, where Russian troops under General Brussilov had begun a sweeping drive against the Austro-German lines to the south. The front attacked extended twenty-five miles in Picardy, where the river Somme flows with many crooked turns, its main configuration in the battle area being a horse-shoe loop which gave the river east and west banks as well as north and south. The line ran north and south. The British had the hardest task in the N. and failed to achieve their objectives at first; in the S. a substantial success was immediately accomplished by the French. In the initial attack on July 1, the British encountered a series of strongly fortified villages—Gommecourt, Serre, Beaumont-Hamel, and Thiepval—but the German resistance was so destructive to their ranks that they struggled back to their own line. Lower down the British struck deep in the German positions. After five days' fighting they made further substantial progress, though hard-hit at several points. Five days later they had methodically completed the capture of the enemy's first line system of defenses on a front of 14,000 yards. The defenses consisted of numerous and continuous lines of trenches, extending to various depths of from 2,000 to 4,000 yards and included five strongly fortified villages, many heavily wired and intrenched woods and strong redoubts. In the second phase of the battle, beginning July 14, the British cut their way through a four-mile line toward Longueval, Pozières, Delville Wood and Bazentin. By nightfall they succeeded in capturing the whole of the German second line from Bazentin-le-Petit to Longueval, a front of over three miles. A fierce struggle waged round Longueval and Delville Wood which continued without pause for thirteen days. Orvillers, an obstacle to a general attack on Pozières, was taken, but it was not until July 24 that the greater part of Pozières was captured. Later the points to the N., including the obstinate fortified village of Thiepval, which the British had failed to overcome were stormed and occupied.

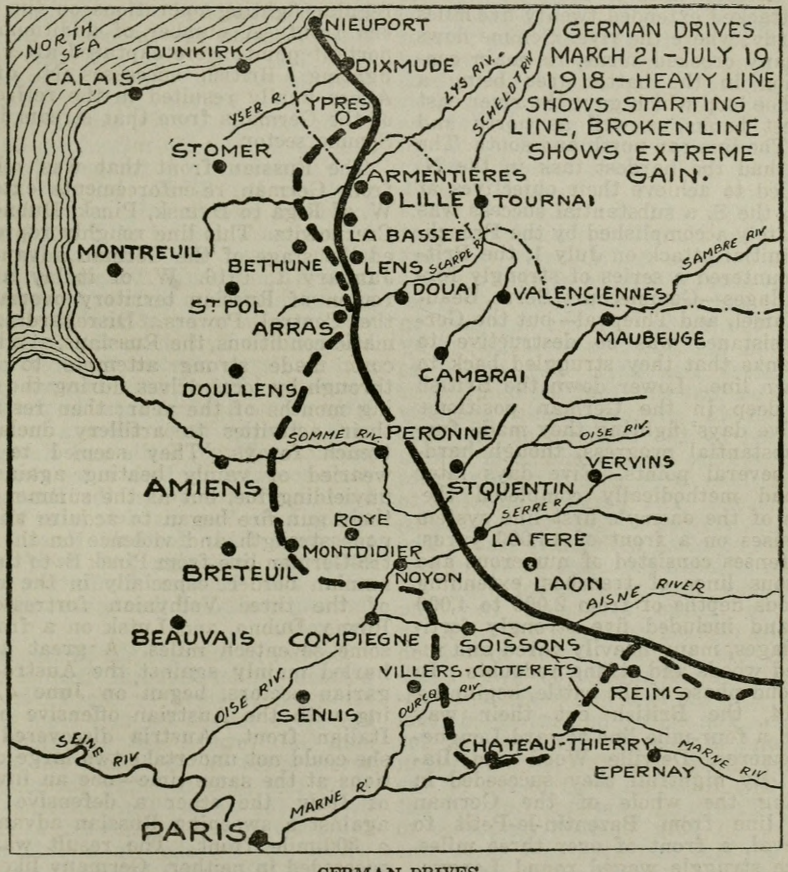
The French under General Foch advanced in the same methodical order as the British. They achieved their successes at less cost, due to less resistance by the enemy. In their attacks N. and S. of the Somme loop they won all their objectives and something more. On a front of ten miles they penetrated in less than two weeks a maximum depth of six and a half miles, or fifty square miles, of enemy territory, containing similar military works encountered by the British.

The Somme offensive duly lost its initial momentum, yet continued throughout the rest of the year as part of the regular fighting operations on the western front. A number of additional important points were captured after hard fighting. British successes N. of the Ancre finally resulted in the retirement of the Germans from that stream in the Somme sector.

The Russian front that was relieved from German re-enforcements extended W. of Riga to Dvinsk, Pinsk, Dubno and Czernowitz. This line roughly represented the stage of the German advance on January 1, 1916. W. of it lay a vast region of Russian territory overrun by the Central Powers. Disregarding climatic conditions, the Russians, at a heavy cost, made strong attempts to break through by local drives during the opening months of the year; then restricted their activities to artillery duels and trench forays. They seemed to have wearied of vainly beating against an unyielding foe, but as the summer came their gun fire began to acquire an ominous strength and violence on the Austro-German line from Pinsk S. to the Rumanian border, especially in the region of the three Volhynian fortresses of Rovno, Dubno, and Lutsk on a front of some seventeen miles. A great attack, hurled mainly against the Austro-Hungarian sectors, began on June 4, timing with the Austrian offensive on the Italian front. Austria discovered that she could not undertake two large operations at the same time—one an invasion of Italy, the other a defensive stand against a sweeping Russian advance on a 300-mile front. The result was she succeeded in neither. Germany like Austria, had withdrawn many troops from the eastern front to aid her Verdun adventure, and Austria had sent similar drafts to swell her forces attacking Italy. No matter how strong the natural defenses nor how skillful the artificial obstacles, the Russians swept on in overwhelming numbers until their offensive threatened not only the pushing back of the Austrian lines but the very exist-

ence of the Austrian armies. The operations during June compelled Germany and Austria to recognize the magnitude of the Russian success. Lutsk, Dubno, and Rovno were retaken; an advance of forty miles in the N. threatened Kovel and Lemberg; twice as extensive an advance in the S. had reconquered Bukowina and east Galicia and had brought the Cossacks to the Carpathians. Germany was doubly forced to renounce Verdun by having to direct large re-enforcements to Volhynia and Galicia to save Lemberg, as well as to the Somme to resist the French and British. This leaving a considerable dent in the battle line made by Russia.

Before Russia had embarked on this drive to recover her lost territory, her armies elsewhere had shown considerable vitality. In Turkish Caucasia, where the Grand Duke Nicholas had been transferred as commander-in-chief, a successful advance had been proceeding. The campaign in this region was related to that of the British in Mesopotamia, where the Turks had the advantage, and Russian activities were needed to relieve the pressure on the British at Kut-el-Amara. The Grand Duke's offensive in



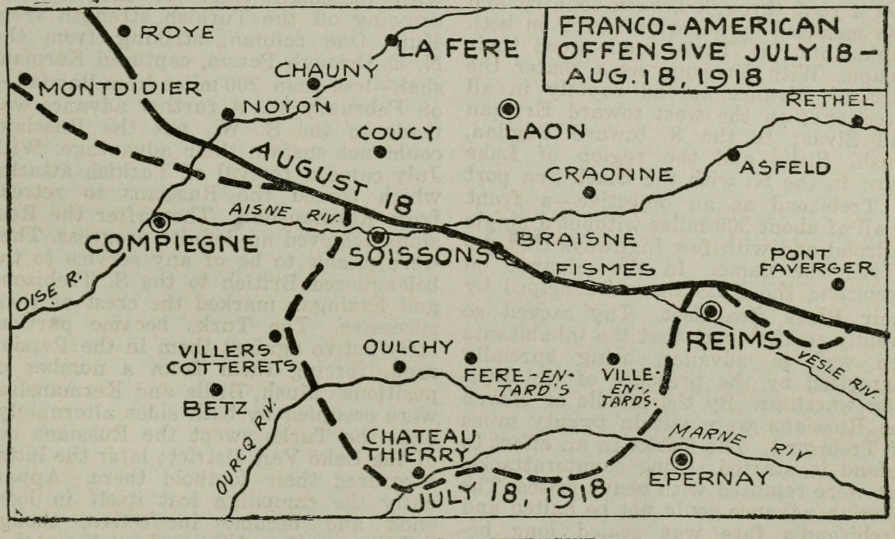
GERMAN DRIVES

diversion of troops and guns to the E. saved the situation; it brought about a stiffening of the Austro-German resistance during the summer against the continued Russian drives on Kovel, Lemberg and Stanislau. The Russians met a number of reverses and were held up at the Carpathians. With the coming of the fall and winter, the fighting waned, Caucasia was undertaken with this aim and also with the object of reaching Constantinople on the W. He first set out to capture Erzerum, the Turkish fortress fifty miles W. on the Russian Caucasian frontier. His armies moved in that direction from three points in February, 1916, the design being to attack Erzerum from three sides. The for-

tress had eighteen separate positions, which encircled the city in two rings and protected the inside defenses. The Turks had four army corps and Kurd, Persian and Arab auxiliaries to defend the place. It was on high ground (6,000 feet above sea-level), to which the Russians had to mount. The effect of the Russian movement was astonishing. After the first frontal attack by Siberian troops, lasting five days, nine of the outlying forts were carried, and the entire fortifications were evacuated without the need of the flanking operations planned. The Turkish command feared the bottling up of some 200,000 of its first-line troops and decided to retreat before the Russian ring was formed. The retreat was a rout through broken country and was menaced by superior forces on both flanks, but the Turks made good their escape. With Erzerum as a center the Russian advance spread rapidly in all directions; on the west toward Erzigan and Sivas; to the S. toward Bagdad, Mush, Bitlis and the region of Lake Van; in the N. with the Black Sea port of Trebizond as an objective—a front in all of about 300 miles without a single railroad and with few highways that deserved the name. In the advance on Trebizond the Russians were helped by their Black Sea fleet. Thy moved so rapidly on that port that the inhabitants fled well in advance, being specially terrorized by the presence of the Russian warships. By the middle of March the Russians were within twenty miles of Trebizond. The Turks in an effort to defend it, started strong counterattacks, but were repulsed with heavy losses. The Russian advance could not be halted and Trebizond's fate was sealed long before the Turks evacuated it. The Russians entered on April 18, 1916. In the W. the Russian center moved on Erzingan, one of the Turks' army headquarters, in the face of strengthened opposition. The enemy had retreated from Trebizond in this direction, making for Baiburt along the Trebizond-Erzingan road. The Russians tried to cut off the fleeing Trebizond garrison, but did not succeed. In May Turkish resistance to their advance increased and there was constant hard fighting which, while unfavorable to the enemy, retarded the Russian movements. At the close of that month the Turks assumed the offensive and forced the Russians back twenty-five miles. The latter did not resume their forward movements until the middle of July, by which time the Turkish opposition had weakened. Baiburt fell on July 15, and from then on the Russians steadily moved toward Erzingan, which they occupied ten days later. Its capture, added to that stretch of territory gained to the N. by the fall of Trebizond and other points along the Black Sea, virtually put Turkish Armenia in Russian possession. In the S. the Russian advance, directed toward Bagdad and to the rear of the Turkish forces besieging the British at Kut, moved in two directions—one from Mush and Bitlis, and the other through Persia. Mush was occupied on February 19, Bitlis fell a fortnight later. The next point aimed at was Diarbekr, an important town on the Tigris at the crossroads of the country's communications. The critical British situation in Mesopotamia caused these Russian movements to be pushed with increased vigor in the hope of drawing off the Turkish strength from Kut. One column, striking from the N. E. through Persia, captured Kermanshah—less than 200 miles from Bagdad—on February 27. A further advance was made to the S. W., but the Russians could not sustain their advantage. With July came a revival of Turkish attacks, which forced the Russians to retreat from Kermanshah. Thereafter the Russians achieved no definite progress. They were unable to be of any service to the beleaguered British to the S. Trebizond and Erzingan marked the crest of their successes. The Turks became particularly active against them in the Persian area, forcing them from a number of positions. Mush, Bitlis and Kermanshah were occupied by both sides alternately; once the Turks swept the Russians out of the Lake Van district; later the latter recovered their foothold there. Apparently the campaign lost itself in loose ends and became ineffective, though fighting continued throughout the rest of the year.

Earlier in the year the British in Mesopotamia under General Townshend had remained besieged by the Turks. A relief force fought its way from the Persian Gulf toward Kut, and came within seven miles of the place on March 8, 1916, this date marking the ninety-first day of the siege. The relieving column faced the second Turkish line at Es-Sinn, which was attacked in a vain attempt to raise the siege. Floods increased the difficulties of rescue, and hopes of saving General Townshend and his 10,000 troops dwindled as the spring advanced. The Kut garrison was slowly but surely being starved out, thanks in part to the Tigris floods, which impeded rescue. The Turkish ring remained unbroken; no food could get through. The expected therefore happened on April 29, when General Townshend (who had wireless

communication with the relief force) sent a message that he could hold out no longer without food, and that he had destroyed his guns and ammunition. A second message intimated that he had hoisted the white flag. On the 143d day of the siege 2970 British troops of all ranks and services and some 6,000 Hindus and their followers surrendered to the Turks. After a lull the British force below Kut resumed their attacks on the Turkish positions without affecting the general situation, and the hot summer brought operations to a standstill. Meantime Great Britain organized another army to repair the defeats of the Nixon and Townshend expeditions, following her old precept that she lost battles but not wars. A new expedition toward



FRANCO-AMERICAN OFFENSIVE

out weak spots—without either side apparently having any definite plan of operations, and without achieving any important result. Austria meantime began increasing her forces until in the middle of May she had sixteen divisions, or more than 300,000 men on the line between the Adige and the Brenta, as well as 2,000 guns of heavy caliber. On May 15 they attacked the Italians between the Adige and the Astico. The ensuing fighting was among mountains generally, the Trentino battle line (24 miles long) running for the most part along peaks and defiles, as the front did elsewhere from the Swiss border to the Adriatic. The Austrians had the higher mountains behind them. Hence the Italians had to make their advance

Bagdad was undertaken in December, 1916, and was marked by consistent successes as it advanced toward its objective.

The Austrian offensive against Italy in the Trentino before mentioned was designed to break through the Italian lines between the Adige and the Brenta, by way of reaching the Venetian plain and capturing Verona and Vicenza. The effect of such an achievement would be to compel the retreat of the Italian forces to the eastward along the Isonzo, and even result in their capture. At the least Austria by such a movement could carry her front well within the Italian boundary to the Po and the Adige. During the spring of 1916 there had been many engagements in the Trentino—mainly reconnoitering movements to find or defense and build their trenches and place their guns to resist an enemy generally situated high above them. They were going up; the Austrians were coming down. That was the salient feature of the Austro-Italian campaign. The Italians had to climb, and the Austrians to descend from elevated points from which they could overlook the Italian lines. Laboring under this disadvantage the Italian Alpini regiments gave way before the strength of the initial attack. The Austrians occupied a number of Italian positions and opened a breach in the narrow zone between the Adige and the Val Sugano. The next day the Austrians renewed the fight with five assaults and gained more positions. The Italian border was crossed in the Lago di Garda region, where the Italians were

driven back four miles from positions they held on Austrian soil. Their line broke at other important points and the Austrian advance steadily progressed. The Italians' retreat was orderly but hurried. By the second week of the fighting they had lost over 30,000 as prisoners, 300 cannon and many machine guns, while their total losses including casualties were put at 80,000. The general direction of the Austrian advance, which had spread to a front of 31 miles, was now toward the Italian line running through Asiago, Arsiero and Schio, representing the third and last fortified defenses, the strategic design of which was to prevent an invasion of the Venetian plain. Finally the Austrians approached the latter about Vicenza, and Italian apprehension was great. By June 1 Italy faced a critical situation; then the tables were suddenly turned. The Austrian offensive lost its force. The Italians showed more resistance, and themselves began to attack the invaders. The great Russian drive on the southeastern front had reacted on Austria's Trentino campaign and changed the whole outlook for Italy. Austria was forced to abandon her movement on Venetia and to shift her reserves eastward to stem the Russian tide. The Trentino thrust was succeeding when it had to be given up, and all Austria's efforts, like Germany's before Verdun, were in vain. On June 9 Italy began her counterattacks in force to drive back the Austrians from the positions they had gained. The latter were now on the defensive and continually yielded ground, being as little able to withstand attacks as the Italians when the position of both foes were reversed. The fighting thereafter was generally marked by a series of successes by the Italians. The Austrians not only failed to resist them, but could not sustain what counterattacks they made. They retreated and step by step the Italians fought their way back in the territory from which they had been ousted.

The Italians next turned their attention to their right or Isonzo front in order to take Goritz and open the way to the capture of the Austrian port of Trieste. This front had not changed in any degree since hostilities opened. On Aug. 4, 1916, the Italians first assailed the mountain strongholds that protected Goritz, which is situated twenty-two miles N. W. of Trieste. They soon gained the Goritz bridgehead on the river Isonzo, which led directly to the city, the Austrians showing only weak resistance. The bridge was stormed, and on August 9 Goritz fell. The Doberdo and Carso plateaus had now to be crossed to reach Trieste. Many engagements took place on the new front during the autumn and early winter, but while the Italians made some headway Trieste remained at a safe distance as the year closed.

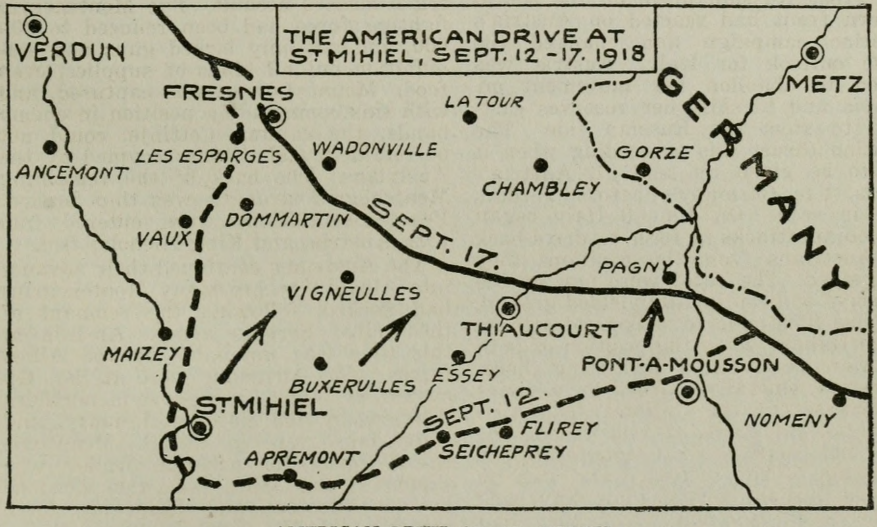
In the Balkans the situation that developed during 1916 was as follows:

Germany had withdrawn most of her troops from this sector, the Serbians having been driven out of the last corner of their native land by Von Mackensen's sweep in the fall of 1915. She had accomplished her object of establishing railroad communication between Berlin and Constantinople, via Bulgaria, and left Austria to deal with Montenegro, and Bulgaria with Macedonia. With the opening of 1916 the Austrians attacked the Montenegrins from the E. on the rivers Tara, Lim and Ibar, while warships in the Gulf of Cattaro opened heavy fire on Montenegro's dominating peak, Mount Lovcen, which was garrisoned. The little state was unable to resist Austria's massed assault. The Montenegrin fighting force had been reduced to 20,000, and not only lacked guns and ammunition but all kinds of supplies, even food. Mount Lovcen was captured, and with this commanding position in enemy hands, the capital, Cettinje, could not be retained, and it was occupied by the Austrians. The back of the remaining Montenegrin strength was thus broken. Peace negotiations were entered into with Austria, and King Nicholas fled.

The Austrians continued their advance into Albania, where many Montenegrins had flocked, following the remnant of the routed Serbian army. Albania at this time was untenable by the Allied forces. The Austrians were at San Giovanni di Medua, a seaport in northern Albania, by the close of January, and Bulgarians were in the S. Meantime, Essad Pasha, the Albanian leader, who supported the Allies, was also menaced by an Austrian and Bulgarian force marching N. W. from Berat, while another enemy column was heading toward Italian forces which occupied Avlona, a seaport in the S. Adriatic. The situation forced the Allies to get the helpless Serbians out of Albania. Some 75,000 were hastily transported by Allied ships to Corfu, others were taken to Tunis and Italy. The Austrians moved S. and the Bulgarians N. toward Durazzo, the Albanian capital. Italian and Albanian forces under Essad Pasha yielded before them, and Durazzo was taken on February 28. The Italian troops meantime covered the evacuation of the Montenegrins, Albanians and the remaining Serbians to Avlona, the only

important point in Albania uncaptured. Allied assistance to Serbia, and incidentally to Montenegro, came too late. An Anglo-French army under General Serrail had been assembled on the Greek front about Saloniki, and from there they attempted to advance through Serbia, but were balked by the Bulgarians S. of Uskub. The Bulgarians, having driven the Serbians out of Macedonia, then attacked the Serrail forces, which fell back to their original line. By March, 1916, the Austrians and Bulgarians were in complete possession of the central Balkan area. The latter hesitated to push their lines across the Greek frontier by further attacking the Allied forces, though they did not hesitate to do so elsewhere against Greek defenders. The Saloniki region was a part of Macedonia that was essentially Bulgarian in population. The Allies, however, had the better military position, being drawn in close to their base, with short interior communications, while the Bulgarians had to spread round the wide semicircle formed by the Anglo-French forces. On the other hand, the latter were not prepared to start an offensive against the Bulgarians. Consequently there was a stalemate on this front which lasted for two years except for a sporadic offensive the Serbians, assisted by the French, made against the Bulgarians in September, 1916, when they regained a piece of their lost territory, including Monastir, and captured 6,000 prisoners. However, the inactive Allies army, to guard against eventualities, especially the uncertain intentions of Greece at their rear, daily augmented and strengthened their position by re-enforcements of men and equipment, so that in August, 1916, it numbered, with Serbian and pro-Ally Greek accessions, nearly 500,000.

The Balkan situation was complicated by the wavering attitude of the government of Greece, due to the monarch's leaning toward Germany. In the fall of 1916 the relations between the Allies and that country became very strained and occasioned a crisis on account of the danger to the Allies' Saloniki front and their naval communications by possible Greek activities on behalf of the Central Powers. The Allies were forced to regard Greece as a menace to their rear. As a precautionary measure they compelled the Greek Government to surrender its entire fleet and the Piræus railroad and to dismantle all its shore batteries. Greece complied under force majeure. Hostile demonstrations in Athens followed, the Greeks themselves being divided between royalists and pro-Allies, and a force of French marines had to be landed, who occupied a number of public buildings and covered the streets with a number of machine guns. The Allies also demanded the withdrawal of Greek troops which had been concentrating near Larissa and in Corinth. The internal situation in Greece between the royalists and pro-Ally insurgents under Venizelos became such that a provisional government of the latter was installed to checkmate King Constantine's pro-German tendencies and declared war on the Central Powers. Pro-Ally Greek



AMERICAN DRIVE AT ST. MIHIEL

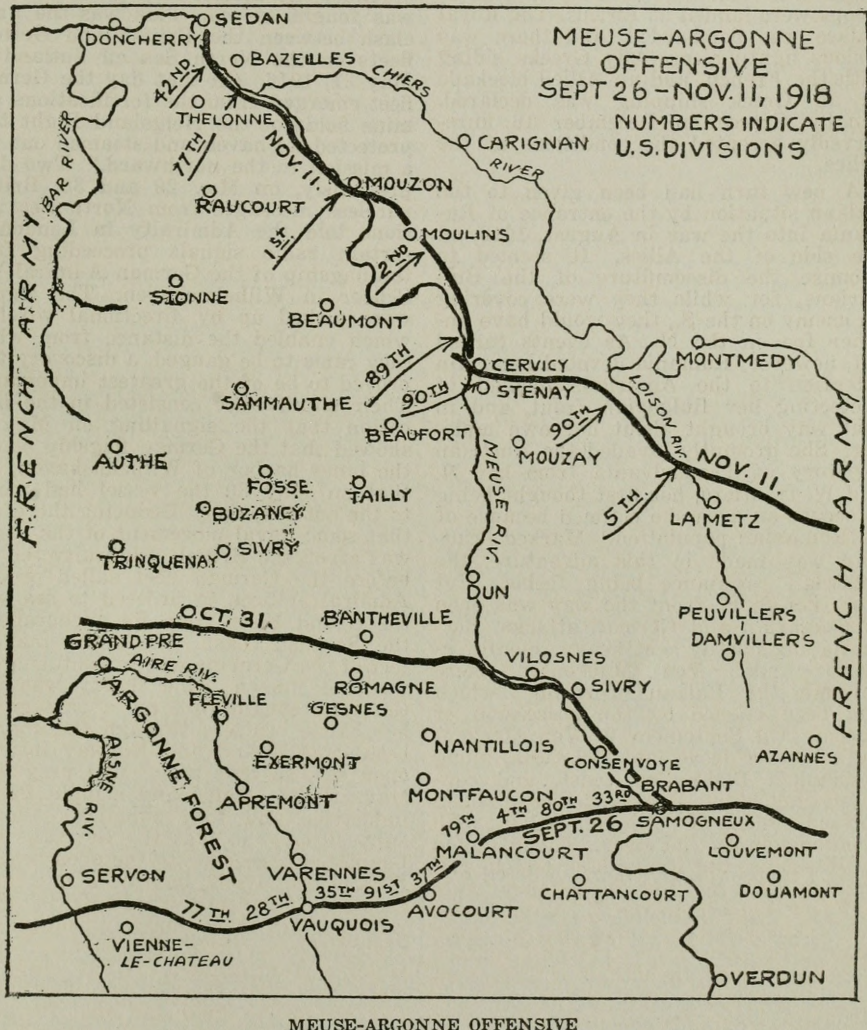
forces were thereupon mobilized. This step followed the King's refusal to recognize the results of the elections, which were overwhelmingly in favor of Venizelos' pro-Ally policy. The royal army became more than ever a menace, and in November the Allies through the French Admiral Fournier demanded that it surrender all arms and munitions and guns except 50,000 rifles. The demand was refused, whereupon French troops were landed at Piræus. The Royal Palace was bombarded, and there was serious fighting, pro-Ally Greeks siding with the French, and an Allied blockade on all Greek shipping was declared. Finally Greece on December 16 unreservedly accepted the conditions of the Allies.

A new turn had been given to the Balkan situation by the entrance of Rumania into the war in August, 1916, on the side of the Allies. It seemed to promise the discomfiture of the Bulgarians, for while they were covering an enemy on the S., they would have another foe on the N. As events turned out, however, Rumania devoted her main attention to the Austrians instead of protecting her Bulgarian front, and in that way brought about her own undoing. She promptly invaded the Austrian territory of Transylvania from her N. and W. frontiers, her first thought being to secure an area she claimed because of its Rumanian population. Marked headway was made in this adventure, the Austrian resistance being feeble. But from her S. E. front the way was open to Bulgarian and German attacks, Berlin having hastily sent heavy re-enforcements under Von Mackensen there through the Balkan "corridor" which had been opened by the possession of Serbia. On September 2, Von Mackensen's legions drove into Dobrudja, along Rumania's Black Sea coast, and captured important Danube bridges which formed lines of communication with Rumania across that river. Though aided by Russians, the Rumanians had to fall back to the N. But while they were suffering defeats to the E., their forces in Transylvania continued to gain against the Austrians. Their triumphs were short-lived, the situation there completely changing with the arrival of strong German forces under Von Falkenhayn to assist the Austrians. The Rumanians were driven out of Transylvania through the mountain passes into their own territory, which was in turn invaded by the Austro-Germans. Then began the squeezing process. With Von Falkenhayn on one side and Von Mackensen on the other applying the pinchers, Rumania was methodically and ruthlessly overrun, the combined invasion reaching its high mark on December 2 with the capture of the capital, Bucharest. Its fall was followed by the subjugation of more than half of Rumania, who thereafter was practically out of the war.

In a year of lengthened battles on long fronts extending over many weeks of time, the most striking and briefest was fought at sea. This was the great clash between the British and German fleets on the North Sea off Jutland on May 31, 1916. On that day the German fleet emerged from the fortifications and mine fields of the Helgoland Bight that protected its haven and steamed out "on a mission to the northward." Two days previously, on May 29 and 30, British wireless messages from North Sea stations told the Admiralty in London of certain radio signals proceeding from the flagship of the German Admiral Von Scheer in Wilhelmshaven. The signals were picked up by directional wireless, which enabled the distance from which they came to be gauged, a discovery that proved to be of the greatest importance. Their significance consisted in the indication that the signalling on May 29 showed that the German flagship was in the inner harbor of Wilhelmshaven, and that on May 30 the vessel had moved to the outer harbor. Deducing therefrom that some naval movement of the enemy was afoot, the British Admiralty the day before the German fleet sailed ordered Admiral Jellicoe to proceed to sea with the Grand Fleet from its anchorage on the Scottish coast. What the real object of the Germans was in venturing out was not known. One theory was that Germany sought to force a passage for her battle cruisers through the channel between Scotland and Norway into the open sea, so that they could prey upon transatlantic traffic and cripple British industries and food supplies. Another supposition was that the Germans contemplated an escape to the open sea, not for the fleet itself, but for a number of fast armed cruisers to raid British trade routes everywhere and supplement the destructive work of the submarines in sinking merchantmen. What only was clear was that the German fleet never left the North Sea, and that its plans were balked by meeting the British fleet, the result of which encounter sent the Germans back to port within thirty-six hours after leaving it, and there it remained, inactive and useless, for the remainder of the war.

The main British fighting squadrons, composed of dreadnoughts, was under

Admiral Jellicoe's command; in addition he had a division of battle cruisers and another of armed cruisers, as well as destroyers and light cruisers. His vanguard was made up of two battle cruiser divisions under Vice Admiral Beatty, supported by a division of dreadnoughts of the "Queen Elizabeth" type under Rear Admiral Thomas. The Beatty column cruised some seventy miles to the



MEUSE-ARGONNE OFFENSIVE

southward ahead of the main fleet. Shortly after two o'clock in the afternoon, when it was about 90 miles W. of the Danish coast, German light cruisers were sighted and became engaged with British craft of the same type. A squadron of five German battle cruisers under Vice Admiral Von Hipper appeared to the eastward, and Admiral Beatty at once swung to the S. E. to cut between them and their base. Thereat the German commander changed his bearings to correspond, which meant that the two squadrons continued on courses nearly parallel. Their lines presently tended to converge until at 3.45 p. m. heavy firing broke from both at an estimated range of nine miles. The almost immediate result was that two of Beatty's battle cruisers, the "Indefatigable" and the "Queen Mary," were struck by broadsides and at once sank This loss placed the Beatty column at a disadvantage in numbers (it began with six battle cruisers and now

had only four), but it was re-enforced by the dreadnought division of Admiral Thomas. The Von Hipper column of five battle cruisers was thus pitted against four battle cruisers and four dreadnoughts, but stood up well before the augmented British fire. Beatty meantime continued to move ahead southward, aiming not only to cut the Germans from their base but to "cap" their column and concentrate his fire on Von Hipper's leading ships. A column of German dreadnoughts under Admiral Von Scheer however, approached from the S. E. at full speed to join Von Hipper. Their appearance told Beatty that he was outmatched. He could not now drive Von Hipper into Jellicoe's arms; but perhaps Von Hipper and Von Scheer could be led there. Beatty quickly changed his plan with this object and himself steamed northward. The two German columns, now joined, took up a parallel course, and the running fight was resumed, both forces heading toward the point from which Jellicoe was approaching. Toward six o'clock Beatty again tried to "cap" his antagonist by turning his head to the eastward. Von Hipper countered this movement by himself turning in the same direction; hence the parallel fight continued on the curve made to the E., which duly straightened to a northward line again. Then the "Lützow," Von Hipper's flagship, dropped out badly damaged, and the admiral, under fire boarded the "Moltke", via a destroyer. Meantime Admiral Jellicoe, some seventy miles to the northward, was rushing the main British fleet to effect a juncture with Beatty. He had three squadrons of powerful fighting ships, twenty-five in all, including his flagship, the "Iron Duke," and the "Invincible," "Inflexible," and "Indomitable". The latter trio, commanded by Admiral Hood, was sent ahead to re-enforce Beatty at a faster speed than that of the main force. They joined Beatty just as the latter turned eastward, and swung in ahead of Beatty's column, which now consisted of seven battle cruisers and four dreadnoughts. The "Invincible", Hood's flagship, became the target of the German guns and disappeared in flame and smoke, the admiral going down with her. Jellicoe's ships now appeared in sight to the northward, and Beatty opened his column to let them through, Jellicoe swept down the lane, steering S. toward the head of the German line, Beatty following suit on a parallel course a little ahead by virtue of his greater speed. Soon the head of the German column was under the concentrated fire of practically the entire British fleet. It was at this stage that the German vessels appeared to have sustained their principal losses. The British had finally "capped" them and were astride the course to the German base. Night, however, came, and with it a mist that thickened to a fog. The German columns, balked from turning S., switched from E. to W., meantime sending all their destroyers against the British warships. Jellicoe's destroyers met them, when ensued a fight between destroyers in the fog which diverted attacks between the main fleets. In the dark, covered by their destroyers, the Germans succeeded in turning S. to safety from their westward course, wholly escaping the British fleet. In the treacherous darkness, and in the midst of a stretch of waters probably strewn with mines, Jellicoe hesitated to pursue the retreating enemy, and thus lost them. With the dawn the German fleet had vanished.

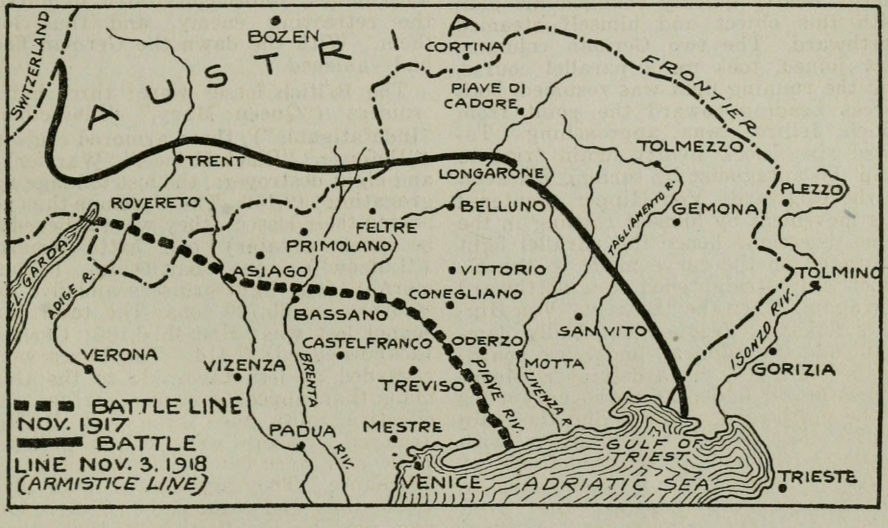
The British losses were: three battle cruisers ("Queen Mary," "Invincible," "Indefatigable"), three armored cruisers ("Defense," "Black Prince," "Warrior"), and eight destroyers, the lost tonnage aggregating 117,150. The Germans thus reported their losses: (they were believed to be much greater) one battle cruiser ("Lützow"), one battleship ("Pommern"), four light cruisers and five destroyers, or 60,720 tons. The total personnel lost was: British 6,105; German (acknowledged) 2,414. The losses were regarded as less favorable to the Germans than appeared on the surface. As effective units the three lost British armored cruisers were of no military value and were caught in the battle by mischance. They aggregated more than 40,000 tons, and reduced the effective tonnage lost by the British by that much. The "Lützow" offset the "Queen Mary". The "Pommern," which was believed to be a new and powerful dreadnought, not an old pre-dreadnought as the Germans claimed, offset the loss of the "Invincible" and "Indefatigable". As far as effective ships were concerned, accepting the German statement regarding the "Pommern" as being an old vessel, the British only lost one more than the Germans, and that was largely offset by the loss of the four light cruisers the Germans acknowledged. Only on the destroyers did the advantage lie with the Germans. The belief that the German losses were much more than was admitted was strengthened by the fact that the Kaiser's fleet never again ventured out to fight the British. A great controversy arose over Admiral Jellicoe's tactics in permitting the Germans to escape in the darkness after, as he himself reported, his fleet

had maneuvered into an advantageous position between the German vessels and their base.

1917

British Advance on Bapaume.—Severe winter weather made any major military operations extremely difficult along the whole western front during the early part of 1917, and as a consequence both sides were satisfied to confine their activities to trench raids and local attacks of minor importance. It was not till the first week in February that offensive operations began, and then the British began to prepare an advance on both sides of the Ancre river. On Feb. 6, 1917, the Germans felt compelled to evacuate Grandcourt. The capture of their heavy guns with them, though they were compelled to abandon large amounts of ammunition. Meanwhile heavy rearguard actions were fought, but the British pressed steadily forward. By the end of February the British were less than a mile from Bapaume.

On March 1, 1917, the British War Office announced that 2,133 prisoners had been captured since the beginning of the offensive along the Ancre and eleven villages had been taken. Some of the positions captured were of first importance, as was evident from the determination with which the Germans defended them. The Germans had retired on the Ancre on a front of twelve miles and a depth of two miles. On March 2, 1917, the Germans, having reached their



FIGHTING IN ITALY

this village was considered of some importance, marking, as it did, a notable advance for the British on the forts of Miramont and Grandcourt, which covered Bapaume from the W.

After occuping Grandcourt, the British began a steady advance up both sides of the Ancre. At the same time the French began to take the initiative on the Verdun front, as well as in the Argonne, carrying on a number of successful raids.

Slowly the Germans gave way to the British pressure, retiring to a new line along the Bapaume Ridge. The ground thus surrendered covered about three miles and the British were able to occupy a number of strong points at very little cost. Fortunately for the Germans, the weather was misty and covered their operations, so that they were able to take second line, began to stiffen their resistance.

The British, however, continued their advance with no lessening of energy. On March 3 they gained two-thirds of a mile along a two-mile front, E. of Gommecourt.

On March 8 the French won a decided victory in the Champagne region. In spite of the deep snow, French forces operating between Butte de Mesnil and Maisons de Champagne carried German positions along a front of a third of a mile, ground which the Germans attempted desperately to retake, but with no success and heavy cost.

By March 12, 1917, the British were advancing along a front of four miles to the W. of Bapaume, on which date they reached a line N. of the Ancre valley, and on the following day they took the

important ridge overlooking Bapaume from the N. W.

On March 15, 1917, the French in the Champagne sector intensified their attacks, and the Germans were forced to abandon their whole line of about fifteen miles from the Oise to Andechy, giving up positions which they had held for two years against repeated attacks. Two days later they drove the Germans out of Roye and took it. N. and N. E. of Lassigny the French made further gains, occupying the town and considerable territory beyond. On March 18, the Germans were in retreat over a front of approximately eighty-five miles from the S. of Arras on the N. to Soissons on the Aisne, evacuating numerous towns and villages, including the important towns of Peronne, Chaulnes, Nesle and Noyon. At this latter point the French and British together pushed on to a depth of twelve miles. The famous Noyon salient, marking the nearest point of advance toward Paris, was now a danger of the past.

Of still greater importance, however, was the occupation of Bapaume by the British, for here the Germans had erected defensive works of the most elaborate description. Still the advance continued. The French, under more favorable conditions, were able to push onward at a faster rate than the British, advancing twenty-three miles during three days. Over 120 towns were recovered by the French alone. During the following week the whole department of the Somme was cleared of the invaders. On April 1, 1917, the British were within three miles of St. Quentin.

The steady pressure of the Allies finally culminated in a terrific attack delivered by the British, on April 9, 1917, N. and S. of Arras. German positions were taken to a depth of two and three miles, but most notable was the capture of the famous Vimy Ridge, which dominated the coal fields of Lens. During two days over 11,000 Germans were taken prisoners. With unabated energy, however, the British pushed on, reaching a point within five miles of Arras. Within the following week they advanced another three miles, and were now within striking distance of Lens, an important mining center, which had been held by the Germans since the autumn of 1914. On April 14 the British guns took up positions which enabled them to hurl tons of explosives into the middle of the city. On that same day the British infantry pushed its way into the suburbs of Lens, the Germans resisting with the utmost vigor.

The object of Field Marshal Haig in attacking Lens was to turn La Bassée from the S. for La Bassée and Lens formed the principal outworks of Lille, which was the key to the whole German position in Flanders. With these two places in their possession, the British would practically have Lille at their mercy.

On April 16, 1917, the French launched a general attack on a front along twenty-five miles, between Soissons and Rheims. Everywhere they met with success, capturing the German first line positions along the entire front. This victory was achieved along the historic line of the Aisne, to which the Germans had retreated after the battle of the Marne. Within a few days the French had advanced on both sides of Rheims, so that that city now formed the point of a salient.

For a week or more the Allied offensive slowed down. But when it was again resumed, on April 23, progress was achieved more slowly. The Germans had brought heavy re-enforcements from the eastern front. They now launched some heavy counterattacks against the French in the Champagne sector, but the few gains they at first made cost them dearly in their heavy losses of men. Early in May the French struck back, and again gained ground, notably the village of Craonne, on a height on the E. end of the Chemin-des-Dames.

On May 9, 1917, severe fighting began again in the neighborhood of Bullecourt. Three days later the British entered this important town and partially occupied it. In their attempt to retake this British gain, the Germans precipitated some of the deadliest fighting which had as yet taken place on the western front. The Germans fought desperately, for here was their Hindenburg line, which they determined must remain intact at all costs.

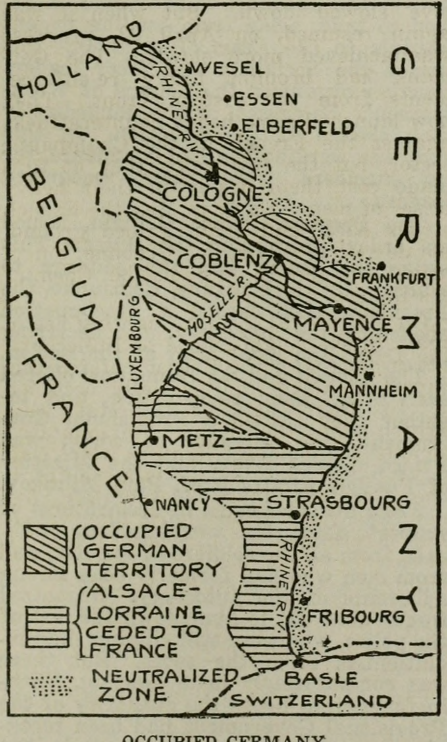
Battle of Messines Ridge.—Early in the morning of June 7, 1917, there occurred one of the most spectacular events which had ever taken place in any theater of the war.

For about two weeks the British had been bombarding the strong German salient S. of Ypres. Here the Allies had, for two years, been at the mercy of the German guns on Messines Ridge, one of the strongest points held by the Germans along the entire western front. For nearly two years the British engineers had been patiently boring under this position. Early in the morning of June 7 the nineteen miles which had been planted under the ridge were ignited, and almost the entire top of the eminence

rose skyward in a burst of smoke and flame. Hardly had the débris settled down when the British leaped into this wide gap in the German lines and within half an hour ten miles of the German first lines had been captured. Large quantities of guns, and 7,000 prisoners were taken. The Germans had now lost their last position which commanded the British lines. Together with their previous successes, by this victory they had now entirely changed the military position in Belgium. The areas gained amounted to a front of nine miles, five miles deep.

During July extremely heavy fighting took place in the Verdun sector. The Germans attacked heavily, but the French were well able to hold them back.

Around Lens the British continued hammering away. Their successes here and elsewhere, however, were somewhat



OCCUPIED GERMANY

counterbalanced by the success attending the Germans in their attack on the British lines N. of Nieuport, on the Belgian coast. Here the British were compelled to give ground. This temporary gain, however, terminated three weeks later when, on July 31, the British and French launched an attack on a gigantic scale along a front of twenty miles, from Dixmude on the N. to Warneton on the S. In their turn the Germans were compelled to retire along a front of fifteen miles.

During the rest of the summer the Allies continued their offensive tactics, surging ahead for a week or two, then pausing to consolidate their gains. Little by little the Canadians, who were attacking Lens, closed their grip on that city and were firing into the very heart of the business section. It was a steady process of eating into the German positions, breaking off a piece here, tearing down a defense there.

In the first week of November continuous French attacks compelled the enemy to relinquish that most important position, the Chemin-des-Dames, which they had held since September, 1914. On Nov. 20, 1917, General Haig launched an attack which marked a new offensive of deep significance, the chief result being the breaking of the Hindenburg line.

The Third Army, under General Sir Julian Byng, began an advance along a front of thirty-two miles, between the Scarpe river and St. Quentin. German defenses were penetrated for a distance of five miles, extending to a point within three miles of Cambrai. The Germans had been thoroughly surprised, and gave ground with comparatively little resistance. Here the British tanks took an important part in the fighting, and contributed in an important degree to the success of the stroke. In two days fighting 9,000 Germans were taken prisoners.

But if the Germans had been surprised, they were equally furious at the blow which they had suffered, and within ten days they were striking back in the Cambrai area with such strength as to stagger the British. Both sides were reenforced heavily. But the British showed less mobility, and gradually they were forced to retire before the German assaults. By the middle of December, however, the British had been sufficiently reenforced to make a firm stand. On Dec. 15, 1917, heavy snow fell and this, too, hampered the Germans.

Meanwhile the French had been slowly but effectively nibbling away at the German positions around Verdun and along the Aisne and the Meuse rivers. The capture of the Chemin-des-Dames had given them command of the strongest positions in that region. Toward the end of the year, however, fighting slackened up and down the entire front and comparative quiet reigned during the Christmas holidays.

The Downfall of Russia's Autocracy.—The new year opened gloomily in Russia.

Strong efforts had been made to drive out the dark forces, that group of traitors within the court circles, headed by the Czarina and the Monk Razputin, who very poorly hid their purpose of bringing defeat to Russian arms. Too late had they realized, when the war broke out, that a victory by the enemies of German imperialism would also mean a defeat for Russian autocracy. They meant now to retrieve their mistake, and sell Russia out to the Germans, and possibly even make common cause with them against the Allies. Shortly before the New Year Razputin had been assassinated by men formerly high in the confidence of the Czar. Honest Russians, however reactionary their politics, they thought that by destroying the brains of the conspiracy, they would end the conspiracy itself. They were soon to discover their mistake. Razputin was dead, but Protopopov, Minister of the Interior, and the dominant figure in the Government, had fully determined to carry out his master's plans.

Protopopov's plan, viewed in the perspective of time, seems to have been this: he would stir the Russian working classes in Petrograd to revolt and thus create a situation which would serve as an excuse for making a sudden peace with Germany. Obviously troops would have to be brought from the front to quell the revolution, and this could not be done without first making peace with the enemy.

To accomplish these plans, he sent his police agents among the factory workers in the neighborhood of the capital and caused them to spread revolutionary propaganda, in the names of certain labor and Socialist leaders, who at that very time were urging the people to support the war against the Germans. But the true manifestoes were suppressed by the Government.

After the death of Razputin the meeting of the Duma, which should have taken place on Jan. 25, 1917, was postponed for a month. This was to delay public discussion of the situation. At the same time food supplies were held back, to raise discontent. Trainloads of flour and other foodstuffs were deliberately shunted off on sidings outside Petrograd and there allowed to rot.

During January and February, however, the people of the capital remained calm. On March 11 the police suddenly began opening fire on the crowds which were peacefully congregated about the streets. Protopopov thought the moment for action had come. There was no resistance, but he ordered out the soldiers in garrison, to support the police. And then happened the unexpected. The soldiers, a regiment of crack guards, refused to fire on the people. Never had this happened before in Petrograd.

The situation now suddenly became serious. The President of the Duma, Rodzianko, sent an urgent telegram to Czar Nicholas, who was just then visiting at army headquarters. Of this appeal the Czar took no notice.

On the following day more soldiers were ordered out, and not only did they refuse to shoot down the people, but they openly went over to their side. Two regiments of mutineers seized the Arsenal. An hour later the bastile of Russia, the Sts. Peter and Paul Fortress, was seized and all the prisoners released.

Anarchy threatened to overwhelm the capital, for the Duma sat almost inactive, not knowing what course of action to take, aside from sending urgent appeals to the Czar. But during this period the Socialists and labor leaders together organized the Council of Workingmen's Delegates, which immediately took charge of the situation. In this body the workingmen had confidence, for its members were their recognized leaders.

The Premier, Prince Golitzin, issued an order proroguing the Duma. This order the Duma had the courage to ignore. On the contrary, Rodzianko, the President, then issued a proclamation abolishing the autocracy, and declaring the Duma the legal head of the nation.

The Council and the Duma now offered each other their co-operation, and together they elected a Provisional Government, the Premier of which was Prince George Lvov, and the Minister of Foreign Affairs Prof. Paul Miliukov.

From all sides came in declarations of support, from the working-class radicals, from all the soldiers in the city, and from men who had formerly been strong adherents of the autocracy. Organized forces went out to hunt down the last of the police, who were still sniping the revolutionists from the roofs. But there was comparatively little fighting. Within forty-eight hours the authority of the Provisional Government had been recognized, not only in the capital, but throughout the provinces. A delegation was sent to demand the abdication of the Czar. A day later the little monarch was back in Petrograd, a prisoner, with his wife and children, in the palace.

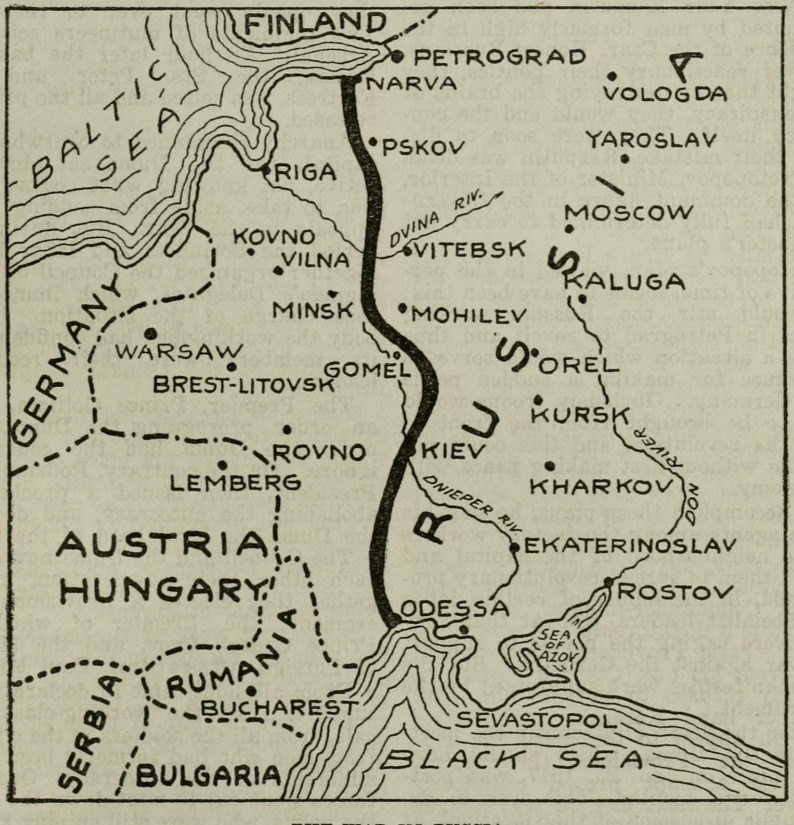
Once order had been established, the Allied countries, one after another, hastened to accord recognition to the Provisional Government, which at once

declared its intention of remaining in the field against the Central Empires.

But soon friction began to appear between the two elements constituting the new government, the Socialists and the Conservatives. The rank and file of the army, having been told that a free Russia had been proclaimed, expected that they would suddenly be able to do as they pleased. This sentiment reflected itself in the Council, or Soviet, by which name it became better known. Fortunately from among the radicals

restatement of war aims. It demanded stronger representation in the government. Finally, on May 16, 1917, the Cabinet was reorganized, the most significant change being the resignation of Miliukov, and the assumption of the portfolio of War by Kerensky, the Socialist.

On July 1, Kerensky, as Minister of War, went personally to the front and endeavored to arouse the enthusiasm of the soldiers for the war. As a result an offensive was begun against the Germans



THE WAR IN RUSSIA

arose a leader who for a time checked this tendency toward demoralization, Alexander Kerensky, a deputy in the Duma, and one of the organizers of the Soviet. By his personality he carried the Soviet to his way of thought, and the leaders made all efforts to restrain the rank and file. Kerensky represented the Soviet in the new government as Minister of Justice.

Differences between the Socialist Soviet and the Conservative Duma continued, however. The Soviet wanted a

and the Austrians, which, for a week, looked promising. But in the midst of their success the Russian forces suddenly collapsed, not through the resistance of the enemy, but because of their lack of desire to fight.

Among the Socialists there was a minority faction, known as the Bolsheviki, whose leaders were Nikolai Lenin and Leon Trotzsky. These were the extremists. They held the belief that the war was being fought only for the moneyed classes, and not in the interests

of the working people. They began spreading a propaganda against continuing the war and in favor of establishing a completely Socialistic government, which should not only make peace with the Central Empires, but abolish private property in trade and commerce and establish communism. It happened that the war-weary soldiers were in the mood to listen to them, and they were, therefore, in a large measure responsible for the failure of the Russian offensive during the summer of 1917.

A new government was now quickly formed with Kerensky as Premier and Minister of War. Though himself a Socialist, Kerensky was bitterly opposed to the Bolsheviki. He believed that German imperialism should be first crushed and, that once accomplished, the Russians might then gradually organize their Socialist Republic. As a consequence he was opposed by two factions; the Bolsheviki from the left, the Conservatives from the right.

Heroically he strove to maintain the equilibrium which was necessary for Russia to maintain her balance. He called an extraordinary council of all elements of Russian society, to meet in Moscow, which it did, on Aug. 26, 1917. But the conference only served to bring out more strongly the line of cleavage between the Socialists and the Conservatives. Both sides were dissatisfied. The people were further depressed when, a few days later, the news came that the city of Riga had been taken suddenly by the Germans.

On Sept. 9, 1917, the situation came to a climax. General Kornilov, the Cossack Commander-in-chief, attempted to proclaim a dictatorship and overthrow the democratic Provisional Government. Aside from his own Cossack regiments, the army refused to support him. On the other hand Kerensky immediately issued an appeal to the army for support of the Provisional Government. Kornilov's attempt proved completely abortive. The next day he was obliged to flee, but was arrested and imprisoned at army headquarters.

Kerensky had triumphed temporarily, but the very elements which had supported him in overthrowing Kornilov now turned against him. There was a strong reaction in favor of the Bolsheviki. At an election of members of the Petrograd Soviet the Bolsheviki suddenly found themselves with a majority.

In the first week of November the Soviet, now Bolshevist, demanded that it have the power of veto over the decisions of the Provisional Government. This naturally was refused. On November 7 the Bolsheviki suddenly precipitated an uprising, and after a day of desultory fighting the Kerensky Government was overthrown and the Premier was obliged to flee.

The Bolsheviki immediately proclaimed the Soviet the supreme power in Russia. Lenin was made Premier, and Trotzsky Minister of Foreign Affairs. The following program was announced.

1. The offer of an immediate democratic peace, in which all belligerents should be invited to participate. Should they refuse, then Soviet Russia would seek a separate peace.

2. The immediate handing over of the landed estates to the peasants.

3. The supreme authority of the Soviet.

The rest of the Allies, naturally, refused even to answer the invitation to consider a discussion of peace terms. So the Soviet sent a request to the Germans to arrange a meeting, with the purpose of proclaiming an armistice, during which peace negotiations might be carried on. On Dec. 17, 1917, such an armistice went into effect. Arrangements were made to hold the peace conference between the Russians and all the allies of the Central Empires at Brest-Litovsk.

Meanwhile elections had been held for members to a Constituent Assembly, which would take the place of the provisional government and take over the reins of government. The result in Petrograd was announced as 272,000 votes for the Bolsheviki, 211,000 for the Constitutional Democrats, and 116,000 for the Socialist Revolutionists, the latter being partisans of Kerensky.

In the first week of December, Kornilov, who had escaped in the turmoil, and a General Kaledin, raised the standard of revolt among the Cossacks in the south. But in spite of their efforts the entire population of Russia showed a disposition to accept the authority of the Soviet for the time being.

The first sitting of the peace conference at Brest-Litovsk took place on Dec. 22, 1917. Among the delegates were Dr. Kuhlmann, German Foreign Minister, Count Czernin, Foreign Minister of Austria-Hungary, Nesimy Bey, former Foreign Minister of Turkey, Kopov, a member of the Bulgarian Cabinet, and a large delegation from the Soviet, consisting of prominent Bolshevist leaders. It was not till the next sitting, held in January, that the delegates got down to a real discussion of peace terms. Meanwhile, for the first time in over three years, not a shot was being fired up and down the eastern

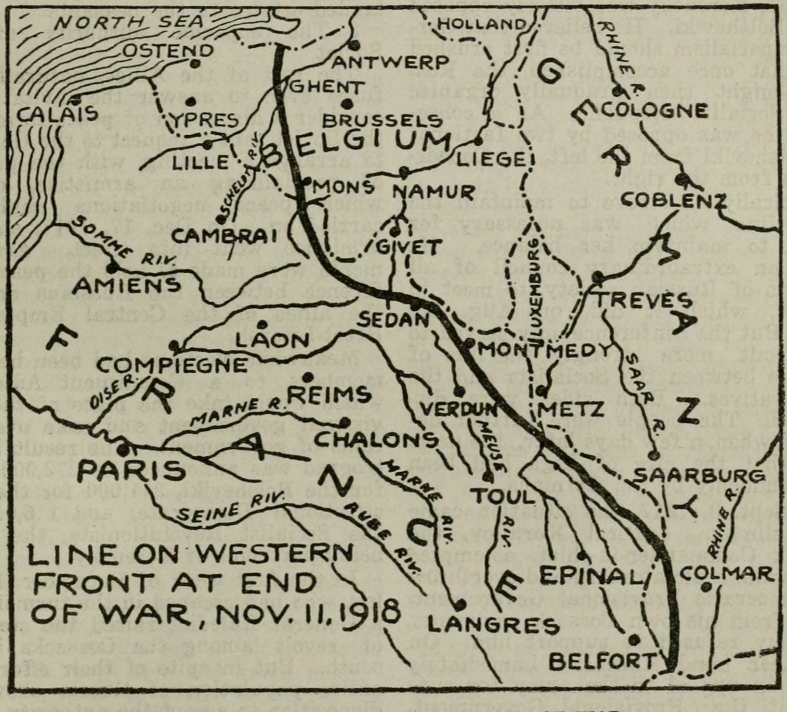
front. German and Russian soldiers lay watching each other from their trenches, sometimes even crossing the intervening space and holding friendly intercourse. The Bolsheviki encouraged this fraternization, hoping to carry on Bolshevist propaganda among the German soldiers. In this work the Bolsheviki were, for the time being, assisted by the Committee on Public Information of the United States, which printed and sent over into the German lines tons of literature tending to discourage the German soldiers with further warfare.

Italy's Defeat and Recovery.—Little of importance occurred on the Italian front during the year 1917 until May 15, when the Italians began their strong offensive movement, culminating in the capture of Gorizia on August 9, Monte Santo on August 24, and Monte Gabriele on September 14. During this period the Italians had apparently performed wonders, considering the nature of the terrain on which they were operating. Steadily they had forced the Austrians back.

The news of the disaster which overtook the Italians, beginning on Oct. 24, 1917, came to the public of the Allied countries with a tremendous and unpleasant shock. Here, as in Russia, the cause seemed to have been the propaganda of the extreme Socialist elements.

Shortly previous, German troops had been secretly arriving on this front, taking their places among the Austrians. On October 24 these troops began their attack. The onslaught came with the suddenness of a stroke of lightning. During the first week the Italians lost nearly a quarter of a million men in prisoners taken by the enemy and 2,300 guns. The attack began in the Julian Alps, then spread southward down to the vicinity of Venice. Tolmino and Plezzo were taken from the Italians; the whole Italian line from the sea to the Carnic Alps wavered, then broke. More important still, the Italians lost Caporetto, on the upper Isonzo, where they had built a series of dams by means of which the Isonzo could be flooded at a moment's notice, so that it would be impassable by any army.

The Italian retreat continued until the Piave river was reached, where British and French troops met them and served as stiffening. General Cadorna had meantime been dismissed, and General Armando Diaz appointed commander-in-chief in his place.



LINE ON WESTERN FRONT AT END OF WAR

On November 11 the Italians came to a line of intrenchments which had been hastily dug along the W. bank of the Piave river. Here they made a stand, offering a resistance which the pursuing Austrians and Germans could not break. The latter therefore dug themselves in, along a line reaching from the foothills of the Alps to the Adriatic.

Now began a long-drawn-out battle, the center of which was on the Asiago plain. Here, fortunately, the terrain was in favor of the Italians, who were able to dominate the plateau with their artillery, stationed among the near-by hills. Another factor in their favor was the system of lagoons which extended from the lower Piave to the sea, across which it was utterly impossible for the enemy to pass.

In vain the Teutons endeavored to turn the Italian right by working their way around the N. limits of the Venetian Gulf. This region the Italians were able to flood and render impassable. Over this artificial sea flitted all kinds of light war craft ranging from armed motor boats carrying machine guns, to light gunboats. The result was a deadlock, which neither side was able to break before the end of the year.

The Balkan Countries.—The beginning of the year 1917 found Rumania badly beaten, taking refuge from the pursuing Germans behind the Russian lines. The Rumanian capital was established at Jassy, and at regular intervals the government of the little country issued announcements of its determination to continue fighting until the death, but as a matter of fact these could be only the ordinary empty diplomatic phrases, for when the Bolsheviki began peace negotiations with the Germans in December, 1917, Rumania hastened to follow their example.

In Macedonia the year began quite uneventfully. The Allied troops under Sarrail had accomplished very little, except to take Monastir shortly before the close of the year, an event of political rather than military significance. This stalemate continued largely throughout the year 1917. In February it was estimated that the total forces of General Sarrail on the Macedonian front numbered about 350,000. This military inactivity was largely caused by the situation in Greece, where the Allies had to solve the problem created by the pro-German proclivities of King Constantine. This behavior on the part of the Greek monarch led from one disturbing situation to another.

Another such crisis had come about shortly before the beginning of the year 1917. The Allies had insisted on the disarmament of the Greek army, which they believed on the point of attacking them in the rear. Rioting broke out in Athens and Allied troops were landed and considerable bloodshed followed. At the same time Venizelos and his adherents formally declared themselves in secession from the Greek monarchy, with headquarters in Saloniki.

Finally the royal government made a sullen submission and agreed to intern the Greek army in the Peloponnesus, but the blockade of the Greek ports which the Allies had instituted was not lifted till March, 1917.

King Constantine, nevertheless, remained a thorn in the side of the Allies. There could be no doubt that he would do all in his power to assist the Germans, the moment the Allies betrayed a weak spot in Macedonia.

On June 12, 1917, it was suddenly announced that King Constantine had abdicated in favor of his second eldest son, Prince Alexander. Naturally, this was only done because of an ultimatum which had been presented to Greece by the Allied governments. Plans for dealing with the situation in this radical manner had first been formulated at a conference held some time previously in Savoy, Italy, between Lloyd Gorge, Paul Painlevé, the French War Minister, and the Italian representatives. M. Jonnart, a French senator, was sent to Athens as Allied plenipotentiary, to solve the problem. He had forced the abdication of the king.

King Constantine quietly embarked on a British warship and sailed for Italy, and Greece knew him no more for the rest of the war. He was accompanied by the Queen, Sophie, sister of the German kaiser, and his eldest son, Prince George, the former heir-apparent, who was also objectionable to the Allies.

Soon after the new king, Alexander, an innocuous youth of twenty-four, invited Venizelos to Athens to form a pro-Ally government. The former premier arrived on June 25, 1917, and within forty-eight hours the members of his new Cabinet had taken the oath of office. On June 29 the Venizelos government announced that it had severed diplomatic relations with Germany, Austria-Hungary, Bulgaria and Turkey. At the end of the month the Allies showed their trust in the new government by withdrawing their officers in control of the Greek telegraphs and the censorship and by returning the Greek ships which had been seized.

On Oct. 12, 1917, the German Emperor, accompanied by Prince August

William and Foreign Secretary, Dr. Von Kuhlmann, paid an official visit to King Ferdinand of Bulgaria. There had already been rumors to the effect that the loyalty of the Bulgarians to the Quadruple Entente needed stimulation.

Mesopotamia and Palestine.—In February, 1917, the British forces on the Tigris began in earnest their advance on Kut-el-Amara, and by the middle of the month they had the Turks at that point completely hemmed in. They succeeded in escaping, however, and on February 26 Kut-el-Amara was once more in the hands of the British. They then continued their pursuit of the retreating Turks.

During the first week of March the British advanced as far as Ctesiphon, the farthest point of their first Mesopotamian campaign. In another week they had advanced so rapidly that they found themselves within twenty miles of Bagdad. Here the Turks were re-enforced, and a pitched battle took place, but again the Turks were defeated, and on March 11 General Maude entered Bagdad at the head of his troops.

From that time on the pressure on the Turks was continuous. The British advanced far beyond and around Bagdad, meeting with comparatively little resistance. On Sept. 29, 1917, the Turkish Mesopotamian Army commanded by Ahmed Bey was routed by the British and historic Beersheba, in Palestine, was occupied on October 31. On November 18 General Maude unexpectedly died, but this had no deterrent effect on the further progress of the campaign. Late in November the British reached the suburbs of Jerusalem and began to besiege it. On Dec. 8, 1917, the Holy City, which had been held by the Turks for nearly seven centuries, surrendered to the British General Allenby. The utmost consideration was at once shown for the religious sentiments of all the peoples whose holy shrines were to be found in the city, all being scrupulously protected by special guards, that they might not be desecrated. The Mosque of Omar was placed under Moslem control and a cordon of Mohammedan officers and soldiers placed around it. Within this cordon no Christian or Jew might enter without a special pass.

Naval War.—During the beginning of 1917 the activities of the German submarines became especially intensive. It was on Feb. 1, 1917, that the German admiralty announced its determination to carry on its submarine attacks without restriction. Within a week the lists of sunken vessels grew and presently these lists could no longer be published. Before July 16, 1917, the United States alone had lost about forty merchant vessels, amounting to more than 100,000 tons. During one week, ending on April 22, the British lost forty vessels over 1,600 tons, and fifteen under that tonnage. In twenty-two weeks England lost 438 vessels over 1,600 tons, 170 vessels under 1,600 tons, and 137 fishing vessels. All together the total loss in tonnage was close to 2,000,000 tons. During the rest of the year this rate of loss continued unabated.

Aside from the submarine warfare the year 1917 was unmarked by any naval engagements of the first magnitude. On Feb. 25, 1917, German destroyers bombarded Broadstairs and Margate on the English coast. At about the same time, on February 15, it was announced that a British cruiser had fought a successful engagement against three German raiders off the coast of Brazil, damaging two of them, while the third escaped. On March 22, 1917, the German Government announced that the raider "Moewe" had returned to her home port from a very successful second raiding trip in the Atlantic Ocean which had yielded twenty-seven captured vessels, most of which had been sunk. The "Seeadler" was another successful raider operating during the year in the Atlantic. She was the former American bark "Pass" of the Bahamas, which had been captured in 1915 and at that time had been taken into Cuxhaven. She had left Germany in December, 1916, escorted by a submarine, and had successfully passed through the British patrols.

During March, 1917, the British Government announced an extension of the danger area in the North Sea.

On April 21 six German destroyers attempted an attack on Dover. Two of them were sunk by British destroyers. Six days later another similar attack was made on Ramsgate. Both Calais and Dunkirk were bombarded by German destroyers.

In the early part of September, German submarines appeared in the Gulf of Riga and bombarded that city. In October it became known that the "Seeadler" had run ashore on Lord Howe Island, one of the Society Islands, in the Pacific Ocean, leaving forty-seven prisoners on the island in a state of destitution. On the morning of October 2 the British cruiser "Drake" was torpedoed off the N. coast of Ireland. She succeeded in making the harbor, but was sunk in shallow water. In the middle of October strong German naval forces took part in the fighting in the Gulf of Riga, pro-

tecting the landing of German forces on Oesel and Dago Islands and later on Moon Island. A Russian destroyer was sunk, and a few days later the Russian battleship "Slava" was reported to have been destroyed.

Germany's African Colonies.—In her East African colonies Germany had made thorough preparations to resist invasion. Though there were only three white regiments, native contingents had been well trained and well armed. As a result the campaign of conquest which the Allies had begun late in 1916 had made at first little progress.

On July 30, 1917, it was announced that sharp fighting had been taking place and as a consequence the Germans had been driven back in the Lugungu river district, and at Ntulira, fifty-five miles S. of Mahenge, the central point between Lake Nyasa and the sea. Slowly the Germans were forced into a retreat toward the Portuguese frontier. The forward movement of the British forces, in the Lindi area, began on Aug. 2, 1917, along the road leading S. W. toward Nyangao and Massassi. Here the fighting was especially heavy and the losses on both sides comparatively numerous.

In Portuguese Nyasaland all but one of the German detachments which had established themselves in the Lujenda and on the shores of Lake Nyasa had now been driven N. on the Rovuma river by a British column advancing from the S.

By the beginning of September, 1917, a convergent advance of British and Belgian troops from the direction of Iringa, 160 miles N. E. of Lake Nysasa, and of a Belgian force from Kilossa, on the Central railway, 150 miles W. of Dar-es-Salaam, had cleared the country between the Ruaha and Kilombera rivers, a distance of fifty miles, and driven all the German detachments in the N. area to the S. of the Ulanga. In the S. area, Tunduru, forty-five miles N. of the Portuguese frontier, was occupied by the British an August 23, as the result of an advance through Portuguese territory from Fort Johnson, at the S. end of Lake Nyasa.

The campaign continued energetically until November, the fighting continuing vigorously throughout that month. During November the European Germans captured or killed numbered 981, while nearly 2,000 native German soldiers had been killed or captured during the same period.

On Dec. 1, 1917, it was officially announced by the British War Office that German East Africa had finally been cleared of the enemy and that the German commander, General Von Lettow-Vorbeck, with about 2,000 men under his command, had crossed the Rovuma river into Portuguese East Africa. He was closely followed by the British.

During the last few days of the year the German forces in Mozambique, numbering about 2,000, attacked the Portuguese at Mt. M'Lula, and succeeded in capturing the position. But the fact still remained that by the last day of the year not a German soldier remained fighting on a square foot of German territory in Africa. Thus Germany was deprived of the largest of her colonial possessions, amounting to about 380,000 square miles, almost double the area of Germany.

Political Events.—On January 10 the Allies re-stated their terms of peace, a separate note from Belgium being included. This official statement had been made necesary by Germany's offer of a peace during the previous December.

On February 3, Bernstorff was dismissed and the United States severed diplomatic relations with Germany. On March 27, Minister Brand Whitlock and the American Relief Commission withdrew from Belgium. On April 2 President Wilson asked Congress to declare the existence of a state of war with Germany, which was done four days later, on April 6. On April 20 Turkey severed relations with the United States. On July 4 the resignation of Bethmann-Hollweg as German Chancellor was announced, his place being taken ten days later by Dr. George Michaelis. In August certain peace proposals by Pope Benedict, dated August 1, were made public, to which all the Allied countries made replies during the following month.

On October 26 Brazil declared war against Germany. On November 13 M. Clemenceau succeeded M. Ribot as Premier of France. On November 29 there was held in Paris the first plenary session of the Inter-Allied Congress, at which sixteen nations were represented, Col. E. M. House being chairman of the American delegation.

During December 6-9 the pro-Ally government in Portugal was overthrown by a revolution. On December 7 the United States declared war an Austria-Hungary.

On December 15, the Inter-Allied Economic Council was organized in London, Great Britain, France and Italy being represented. Assistant Secretary of the United States Treasury, Oscar T. Crosby was elected president.

1918.

At the beginning of 1918, the penultimate month of which was to see the war end in a crushing victory for the forces of the Allies, the long intrenched battle-line running through France and Belgium from Switzerland to the sea had been moved but little from what it had become in October, 1914, following the general digging-in on both sides that succeeded the first battle of the Marne and the German retreat to selected positions. By that time all the Powers who were to play any considerable part in the war had already become engaged, those that were to follow during 1918—Guatemala, Costa Rica, Nicaragua, Haiti, and Honduras—took action more as evidence of their solidarity with the United States than on any understanding that their support would weigh heavily in the balance. By the opening of the year the United States had already been nearly nine months in the war and at the end of that time her resources had not yet shown all the potentialities that lay in them, though her preparations had been on an extensive scale. As a result prodigious efforts were being put forth by the Germans in the effort to obtain a decision before the great strength of the United States was flung in full measure into the scales. Meanwhile in the east demoralization had already set in in the Russian ranks, and the causes which were to result in the Russian revolution had already brought operations on the front to what amounted to a standstill. The downfall of Russia had its effect likewise on the Balkan front. After the Allied army operating from Saloniki had wrested the Serbian town of Monastir from the Bulgarians little progress was further made till the important events in the summer of 1918 had their effect on all fronts. Rumania meanwhile had, as a result of her rashness in fixing her attention too intently on the freeing of Transylvania, opened the Dobrudja to the German forces under General Mackensen, who at the beginning of 1918 showed himself in a position to advance over most of Rumania. Meanwhile in the Near East the initial successes of the Turks had come to an end, and the Turkish armies had come to suffer during 1917 a number of serious reverses. Jerusalem had gone the way of Kut-el-Amara and Bagdad into the hands of the Allies, and by the beginning of 1918 the Turkish line on all fronts had shown signs of cracking. At the beginning of 1918 the Italian fronts stood where they had taken up their positions following the serious reverses when the Austro-German forces drove back the Italians to the Piave river. At the beginning of 1918 all the German colonies had been taken by the Allies with the exception of German East Africa. This last colony was to hold out to the end and was to surrender only at the period when the armistice called for a suspension of hostilities on all fronts.

Diplomacy.—At the beginning of 1918 while the winter held the fighting in check, the subject of war aims was being energetically discussed in all the belligerent countries. At the beginning of January the war aims of the British Labor party were made known, and on January 5 Mr. Lloyd George set forth the British Government's aims in an address before the trade unions. Three days later President Wilson in a message to Congress laid down the famous "fourteen points," with which the British and French Governments a little later expressed their agreement. On January 24 the German and Austro-Hungarian Governments replied to President Wilson's presentation of the fourteen points. Von Hertling, the German chancellor, argued against the points in so far as they touched on Poland, Alsace-Lorraine and the German colonies, and held that Belgium could only be discussed in union with the inviolability of German territory. The attitude taken by the Government of Austria-Hungary was less unbending and agreement was expressed with the principles underlying most of the points, while objection was made to those bearing on what was considered the internal interests of Austria-Hungary. Neither reply met the requirements of the Allies, and on February 11, President Wilson, after an Inter-Allied Council at Verdun had expressed its dissatisfaction, laid before the joint session of Congress a message in which he outlined the points essential to any basis for the discussion of peace, including regard for the interests of peoples concerned in any settlement and for their national aspirations, having regard also for the essential justice of each case. The upshot was the decision taken at the third session of the Supreme War Council, held at Versailles during the four days ending February 2, that force should continue to be employed till a more amenable temper appeared on the side of the Central Powers.

In the latter part of February a meeting called by the Inter-Allied Labor and Socialist Conference indorsed President Wilson's declaration of principles, and negotiations continued in a haphazard way till President Wilson early

in April declared that force would continue to be employed against Germany. Nevertheless expressions of opinion continued to be made on one side and another, and the charge of Count Czernin that the question of Alsace-Lorraine had alone prevented a settlement, Premier Clemenceau retorted by publishing the noted "Sixtus Letter" in which expression was given to the willingness of the Austrian Emperor to the restoration of Belgium and Serbia and the recognition of the rights of France in respect to Alsace-Lorraine. A period of "disclosures" and recriminations followed in which letters by Prince Lichnowsky were followed by diaries by Dr. Mühlon, a former director of Krupps, who had settled in Switzerland. In the meantime the Ukraine, having declared a republic, made a peace agreement with Germany, and agreed to exchange food products with the Central Powers, who were to pay in manufactured goods. On March 3 the revolutionary government of Russia signed the treaty of Brest-Litovsk, another treaty being signed with Finland, the independence of which was recognized by Germany. In March a treaty was also signed between the Central Powers and the occupied kingdom of Rumania. A meeting on May 16 between the German and Austrian emperors at the German headquarters was succeeded by the announcement of a renewal of the alliance between their respective countries for twenty or twenty-five years.

Discussions were, however, not left entirely to governments and the heads of governments. The Socialist and Labor parties in all the belligerent countries carried on pourparlers indirectly, the upshot generally being that these parties, while holding in common certain principles, identified themselves with the war aspirations of their respective countries. Efforts were occasionally made to bring about a conference, and Huysmans, secretary of the Brussels International Socialist Bureau, invited an expression of opinion from the German Socialists on the memorandum of war aims adopted at the Inter-Allied Labor and Socialist Conference at London late in February. The declaration of war aims contained in the memorandum was declared to be annexationist in character by Herr Scheidemann, leader of the German majority Socialists, who further announced that German Socialists held to the revolution of July, 1917. A more conciliatory attitude was taken by the German minority Socialists, who submitted a declaration similar to the statement of the Socialist parties in the countries of the Allies. The attitude of the Socialist parties in the other countries allied with Germany was not made clear at the time, but there was a general feeling that the principles set forth received their adhesion in varying degrees.

So matters in the field of discussion and diplomacy drifted on toward the middle of the year, when in the latter part of June Von Hertling, the German Chancellor, made the statement that he had given his adhesion to the four principles adumbrated by President Wilson, but was averse to the setting up of a League of Nations such as the Allies had suggested. About the same time Von Kühlmann, the German Foreign Minister, gave it out as his settled opinion that peace could not be achieved on the field of battle and could only be brought about by negotiation. Nowhere did this expression of opinion arouse sharper protest than in Germany, where a remarkable series of victories stretching from the beginning of the war had cultivated an optimism that the darkening clouds of 1918 had not succeeded in overshadowing. Von Kühlmann was accordingly forced to resign on July 9, his place being taken by Admiral von Hintze. The discussions in the Reichstag during this period revealed the underlying pessimism which had begun to lay hold of officials in the German Government and the German military leaders. The recurrence of Independence Day in the United States meanwhile gave President Wilson an opportunity to restate the war aims of the United States and of the Powers associated with it. He declared that those war aims sought, first, the destruction or reduction to powerlessness of every arbitrary power; secondly, a settlement on the basis of free acceptance of conditions by the people concerned; thirdly, consent of all nations to be governed in their relations with each other by the principles of honor and respect for the common law of civilized society; fourthly, the establishment of an organization of peace. Neither the substance nor the manner of President Wilson's address found an answering echo in Germany. The Chancellor, Von Hertling, in reply charged the Allies with being inspired with the spirit of aggressors, and made the declaration that it was not the decision of the German Government to remain in permanent occupation of Belgium, and that she was retaining her hold on that country for the service such hold would be to her in Germany's subsequent dealings with the Allied Powers. Meanwhile the part Alsace-Lorraine was to play in those negotia-

tions remained a frequent theme for discussion both in France and in the countries which were aware of the strength of the French sentiment in regard to it. An influential body of opinion in Germany declared for a plebiscite such as would let the world know what was the feeling of the inhabitants of Alsace-Lorraine themselves in respect to attachment either to France or Germany. But the concession found little favor in France, where it was realized that German occupation for over forty years and the infiltration of German blood and influences would be likely to lead to results unfavorable to French claims. Meanwhile the pouring out of blood and treasure and the withdrawal of the workers from productive occupations had brought on serious conditions in the countries of all the belligerents. Famine threatened the eastern countries, and had already caused terrible ravages in India. The remarkable system of organization in the preservation and distribution of food in Germany had staved off starvation, but in Austria-Hungary things were more serious. In France, Great Britain, and Portugal, which could all more directly rely on the United States, conditions were less grave.

Meanwhile reports of gathering pessimism and dissension among the Central Powers and their allies began to find credence. Germany was held to be dissatisfied with the part played by Austria-Hungary. The latter was said to resent the domineering methods of her more northerly neighbor, the old hostility between Bulgaria and Turkey was said to be reviving, and the tendency for each of them to take their own part more independently seemed to be showing itself. These signs were taken as evidence of growing demoralization, and of a general sense among the Powers concerned that defeat loomed not far ahead of them. The accessory causes that lay at the bottom of the mutual dissatisfaction were also in some cases clear. The treaty of Bucharest had presented to Bulgaria the northern part of the Dobrudja. Bulgarian ambitions had, however, aimed at getting the whole of that territory, and in the negotiations to that end had met with opposition from Turkey. Added to this the Turkish Government put forward demands to the effect that Bulgaria should return the station of Adrianople on the right bank of the river Maritza, which they had ceded to Bulgaria in 1915. This was objected to by Bulgaria. The German Government left the question in abeyance to which both as a result took offense. On the other hand questions as to extension of German or Austrian authority over Poland aroused antagonistic feelings both in Germany and in Austria. The Government of Austria-Hungary held that Poland should be made a province of the empire, while the German view was that German interests had a primary claim and that the vital concerns of Germany were inconsistent with the establishment of a new state so near her borders. The solidarity between the German-speaking populations of Austria and those of Germany, and the mutual antagonisms among the various other nationalities held together in the Austro-Hungarian empire added complications that made rather for distrust and disintegration than for a strengthening unity of aim.

In the meantime events in Russia had attracted the attention of the whole world. The empire of the Czar had gone, the mere pretense of carrying on a war with the Central Powers had been surrendered by those into whose hands the government of Russia had fallen, provisional governments had succeeded each other with power continually strengthening in the hands of the Bolsheviki who represented the strong popular view, the contest between the old order and the new had grown continually in bitterness and in the area over which it was waged with the continued weakening of the old authorities and the continued recruitment of new men into places of authority, and an immense Communist republic, putting into action principles that had hitherto been only preached in other countries, had begun to arouse the curiosity of the whole world. Many of the governments, however, angered at Russia's desertion of the Allied Powers, took a more hostile view of Russian events. In August Japan and the United States made an agreement with respect to joint intervention in Russia and, in course of time, a force of Americans was sent to Siberia, along with some regiments of Japanese. As events progressed, a still more decided stand was taken by the United States Government in respect to the new Government of Russia. In the course of September a number of documents were made public the purport of which was to show that the Bolshevist leaders in Russia had been in the pay of Germany. On September 21 President Wilson gave out a statement in which he called on the neutral nations to take a stand against the Bolshevist règime of terrorism. In September the question of peace began to move into the region of actuality and the initiative in each case was

taken by the Central Powers, who thus gave evidence to the world of their belief that the tide had set in against them. The Austro-Hungarian Government set the ball rolling by an appeal for a conference to debate the ending of hostilities which would not be binding in its decisions, but which might show the way in the direction of a return to peace. Similarly a more amenable attitude began to be shown by Germany, which made an offer of peace to Belgium, while the same Power offered to enter into negotiations with Finland whereby attacks were to be discontinued on eastern Karelia on condition that the Allies should withdraw their troops from that and the Murman regions. A note of irreconcilability was, however, sounded by President Wilson on September 27 in a restatement of war aims, in which he laid down again the principles on which the proposed League of Nations should be established.

The days that followed showed a disposition among the Central Powers to amend considerably the demands that had formerly been put forward by them. This was particularly shown in the appeal of Prince Max of Baden, the new German Chancellor, in which he invited the President of the United States to take steps which would bring about a cessation of hostilities. The appeal was followed by news to the effect that a revolutionary movement had made great headway in Germany. An exchange of notes took place between the German and American Governments and the proposal for an armistice was accepted on November 4. The pourparlers were accompanied by despatches which announced the overthrow of one government after another among the various states making up the Central Powers and the establishment of republics. The culminating point was the abdication of the Kaiser and the establishment of a provisional government in Berlin with the majority Socialists in control. In Austria-Hungary also the emperor abdicated and the various movements for Slav independence began to issue in provisional governments for the several states of what had been the dual monarchy. Preparations then began to be made for the Peace Conference and on November 29 the names of the American delegates were made known. They included that of President Wilson himself, the others being Robert Lansing, Secretary of State; Colonel Edward M. House; Henry White, ex-Ambassador to France; and General Tasker H. Bliss. The presidential party sailed on December 4 for the Conference, arriving at Brest on December 13, and at Paris on December 14.

Military Operations.—The beginning of 1918 opened with numerous optimistic predictions from Germany, heartened by the collapse of Russia, to the effect that the spring would witness on the western front a series of blows that would scatter the armies of France and Britain before the full strength of the United States could be summoned to their aid. There was no question whatever that the defection of Russia had relieved a tremendous burden from the Central Powers and had made the task of the Allies immeasurably more difficult. It was realized that vast quantities of material due for expenditure on the eastern front, could now be transferred to the western front, and the railways of Germany henceforth groaned under the weight of men and material being transferred from one end of the country to the other. Meanwhile victories were not all on the side of the Central Powers and their allies. British forces in the Near East had recovered some of their prestige, but returning to the Turkish front with new men and new material, were making some notable advances. The United States also had succeeded in rushing help to France with greater speed than was anticipated.

Careful preparation had been made by the government of the Central Powers for the blow that was to be delivered on the western front. Among men and materials careful selection was made of what Russia had left at their disposal, and men in the prime of physical life, none of them over 35, were chosen to form the core of the regiments that were to take part in the culminating advance. The older men and the very young were left to hold the occupied parts of Russia under the Brest-Litovsk treaty, but it was calculated that out of the eastern material it would be possible to build up almost 60 divisions numbering 12,000 men each, thus adding to the strength of the western front to the extent of about 700,000 men. Already in the several months of the new year it was estimated that the German front in the west was being held by 2,100,000 men and that the increase that had yet to come would swell the figure to a total of 2,340,000, which would approximate the figures on the Franco-British side. It was, however, realized that with the coming of the Americans the forces of the Allies would augment continually so that at the end of a few months the numerical superiority would be very considerable. On the other hand the

German military leaders considered that numerical superiority, when not too great, would be discounted by the superior German system of railways and the advantages that followed from the fact that the Germans were fighting on interior lines and that the Allies were fighting on exterior lines.

During the winter months fighting on any large scale was impossible on the western front and the early period of the year saw little more than a succession of trench attacks and raids for purposes of reconnoitering. These reciprocal raids went on along the entire front, sometimes preceded by bombardment, but more often made as surprise attacks in the course of the night or early morning. The Germans usually showed the initiative and it was evidently the intention to try the weak points of the Allied line in preparation for the great spring drive that was to follow. On the other hand the Allied forces were not active. They knew that strong concentrations were being made behind the German front, and their raids and attacks were in the main directed to the purpose of discovering the points at which the concentrations were being made. Aviators were active on both sides supplementing the reconnoitering activities of the forces on the ground.

Early in the year also trained American troops were in condition that permitted them to take over a section of the front. They had received their finishing drill in camps near Nancy and Toul, and it was decided that when the time came they could do their best work at the St. Mihiel salient, which had remained substantially unchanged since the Germans took up their position in the vicinity in 1914. The line taken up by the United States forces ran along Apremont and Flirey and Remeneauville. Their baptism of fire came very readily as soon as one or two raids had shown the Germans whom they had opposite them.

On March 21 the Germans let loose the powerful blow on the western front to which such deliberate preparation had been given. Its success shows that it was inspired by principles of sound strategy, which aims at the weakest point in the opposing forces. The blow fell in the main on the British and particularly at the point where the French and British forces were in contact and the aim was to strike suddenly with irresistible power, break through, isolate the British from the French, roll the former armies up against the Channel ports and, if possible, give them the alternative of surrender or of being driven into the sea. It was then intended to turn southward and attack the French and so make a second onslaught on Paris. The blow almost succeeded. Had it been possible for the Germans to put their complete plan into operation they might have succeeded in offsetting even the great superiority in numbers with which the United States was already beginning to endow the Allies. But for complete success even in its preliminary stage a passage so pronounced had to be cut that German forces might be able to reach Amiens and the coast. This is where the German blow fell short. A broad gap was hewn through the British forces at the point of junction with the French forces and day succeeded day while the news went round the world that British regiments were being annihilated and the Germans were marching to the sea almost without further opposition. The line selected for attack was between Marcoing, near Cambrai, and the Oise river, and was defended by the British Fifth Army, under General Gough, having been a portion of the line formerly held by the French. It was powerfully fortified and might have been held under ordinary circumstances by forces inferior to those attacking. Its defensive positions consisted of an outpost line, a resistance line, and behind these the battle line proper where the most powerful resistance could be put up. The arrangement of the outposts made it possible to pour a strong enfilading fire on the Germans as soon as they had passed the outpost line. The advance began a short time before five o'clock in the morning when the fog hung over the battlefield. The British had had forewarning of the advance and had made preparations to meet it, but the impetuosity of the attack upset the plans of defense. The outpost line was in German hands almost before the British knew that the attack had been launched. The resistance line went almost as easily as the first line of defense, and the only real fight occurred at the third or battle system of defense. The British divisions manning the system were ultimately scattered by the onrushing Germans who drove forward through the tremendous gap cut into the British Fifth Army, and with a gigantic plunge directed their advance along the road to Amiens.

The German advance henceforth looked as though it was about to carry everything before it. The attack had a Napoleonic unerringness and completion of plan, and only because the object aimed at required an almost superhuman strength to achieve had it fallen short

of perfect success. It was preceded by an intense but not lengthy artillery fire made up chiefly of gas shells and high explosives. Simultaneously heavy bombardments were directed on the front in the Champagne and other sectors with the evident intention of preventing reenforcements from being brought up. A touch of the marvelous was lent to it by the periodic bombardment of Paris from a gun emplaced in the forest of St. Gobain, a distance of something like seventy-five miles. The dropping of the mysterious shells in the streets of Paris long remained inexplainable and many were the sources to which they were first attributed. Meanwhile the battle line of the Germans from La Fère to the S. E. of Arras displayed enormous activity in the pushing of the offensive. The first attack broke the British lines of a sixteen-mile front from near Gouzeaucourt to Lagnicourt. It drove the British from positions held by them from the battle of Cambrai toward the close of 1917. On the day following the first attack, namely March 22, the Germans first bombarded the British along the whole front and following the artillery fire up with an infantry attack smashed through the entire British position along the extent of the whole front. The British Fifth Army was thus completely isolated from French support at La Fère, and the permanent British position at Arras and with unrelenting energy the Germans started to roll it up. The task was not a difficult one, for organization had deserted the British who henceforth formed but a fleeing and struggling mass of humanity. Meanwhile the German armies drove along the road to Péronne and Albert, and along the route from St. Quentin to Amiens, and through the Oise valley by paths which led to Paris and the S. of Amiens. The advance continued at what appeared an uninterrupted progression for four days and it looked as though the Germans were destined to reach the sea and drive a permanent wedge between the French and the British. The defeats inflicted on the British on the 21st and 22d were repeated on the 23d at Moncy, St. Quentin, La Fère, and Cambrai. Meanwhile demoralization attacked other portions of the British front and the British second positions between Fontaine-les-Croiselles and Mœuvres were broken beneath the German strokes. It was hoped to stem the German onrush on the banks of the Somme, but here as elsewhere the defense put up fell before the German attack. On the fourth day of their advance the Germans took Péronne, Chauny, and Ham and threw their forces over the Somme by hastily constructed pontoon bridges, which the demoralized British artillery fire was unable to destroy. Maintaining their advance, the Germans on the 25th took Bapaume, Nesle, Estalon, Barleaux, Biaches and Guisrard. By this time the British armies opposing the Germans had suffered a succession of defeats that put them almost wholly hors de combat and if Amiens had to be saved it was seen that the task would have to be undertaken by the French themselves. Accordingly on the 25th the French War Office announced that the British lines S. of St. Quentin and around Noyon had been taken over by the French. From that time onward there was a slowing up in the German advance. On the 26th the Germans had reached the battle line of 1916 at several points and succeeded in taking Roye, Noyon, and Lihon. But here the complexion of things began to change. Moving with a swiftness such as the desperate posture of affairs warranted, the French came up along the southern front as far as the Ayre and succeeded in forming a junction with the ragged end of the British front at Moreuil. French support succeeded in stiffening the back of the British to some extent, and the line was further strengthened by recruits from the forces employed in various occupations behind the line. On the other hand the tremendous exertion of the Germans had reached the limit almost of human endurance and the carrying forward of the whole front with the enormous mass of material needed if the new front was to be made permanent was a second undertaking of great arduousness. The German troops that reached the line of Albert and Moreuil were as a consequence in the last stages of exhaustion and the slowing up process was as a result an almost natural operation. On the 27th the new army of British and French forces recognized the indications of spent forces, and with a new accession of courage attacked the Germans and recaptured Morlancourt and Chipilly and advanced as far as Proyart. On that same day, however, the Germans captured Albert and crossed the Avell, compelling the French to fall back E. of Montdidier. On the 28th there was a similar distribution of loss and gain. Montdidier fell into German hands, but to offset this they were repulsed at Arras. It was now possible to estimate the progress made by the Germans and the extent of their gains. They had driven a thirty-five mile salient in the direction of Amiens, broad at the base but dangerously narrow at the neck. While the Allies had been

driven back to points near the coast the accidental positions in which they found themselves were on elevated ground from which they could overlook the German lines and bombard them with accuracy. The task before the Germans was to broaden the salient by a renewed advance, and this they attempted to do. The initial success, however, could not be repeated. Their positions were not so favorable, nor could a similar process of preparation be gone through. The attacks and counter-attacks went on through April, but the Germans did not succeed in pushing their positions nearer the coast. Nevertheless, the battle of Picardy, while not achieving the evident purpose of driving a wedge as far as the coast, was a huge German success. The Germans took over 90,000 prisoners, 1,300 guns, and 100 tanks. They retook all the ground they held previous to the first battle of the Somme and in addition something like 1,500 square miles. And from the point of view of the Allies the blow fell just short of disaster.

The battle of Picardy and the second battle of the Somme showed that there was something radically wrong in the organization of the Allied armies. The confidence that had hitherto inspired them was badly shaken, and all recognized that they had been saved by a very narrow margin from events that might have changed the whole face of the war. In the face of the general demoralization and almost total eclipse into which they had fallen they were prepared to adopt measures which had formerly appeared distasteful, but which were now seen to be necessary. The most important step to be taken was to appoint a single commander-in-chief for all the Allied armies. The British General Staff was opposed to the move, but the British public appeared to be in favor of it. President Wilson had also argued for a unified command, and General Pershing had shown readiness to put the American forces in France at the disposal of the Allies. In the end General Foch was named commander-in-chief of all the Allied forces in the field. Subsequent events showed the move to be a wise one.

Meanwhile the Germans were seeking to follow up their success before Amiens with another advance which would relieve the pressure on their attenuated forces in that region and help them further in their effort to reach the coast. As a result of these calculations they suddenly began to attack between the elevated ground N. of Ypres and Arras. The intention in this case was to drive a wedge between the British forces at Ypres and the British forces at Arras, repeating the operation that had been attended with so much success farther S. Had there been an equally successful advance in this break through, it was clear that Calais and the other channel ports would have fallen, with incalculable results to the British. On April 9th the Germans captured Richebourg, St. Vaast and Laventie, creating a gap of about three miles in the British lines through which they drove in large numbers. On the following day they crossed the river Lys and attacked the base of Messines Ridge, capturing the village and forest of Ploegsteert, as well as Armentières. Attacking from La Bassée to the Ypres-Comines canal they took Estaires and Steenwerck. On the 12th they were within five miles of Hazebrouck and it looked again as if the British line was to be smashed to pieces. It was on this occasion that General Haig issued the appeal to his troops: "With our backs to the wall and believing in the justice of our cause, each of us must fight to the end." General Haig's statement appeared on the 12th, but the German attack went forward and on the 17th they captured Poelcappelle, Langemarck, and Passchendaele, long held by the British. The reorganized British made an attempt to retake Messines Ridge on the 17th, but the only result was that they were driven back in hopeless confusion, so that their positions on the 18th were almost co-terminous with those held by them before the battle of Ypres in 1914. The blow to British self-confidence and pride was felt keenly, for the terrible succession of failures and flights appeared to show that the Germans could strike at will on any part of the British front in the certainty of victory. On the 19th, however, French reserves were brought up and their support put new courage and strength into the British lines.

The German blows were far from spent, however, and on the 27th, Mount Kemmel, the remaining key to the Ypres salient, fell to them after bloody fighting in which the British, supported by the French, were driven beyond the villages of Kemmel and Dranoutre. French gallantry showed up conspicuously in this battle, in which hundreds of poilus refused to budge and preferred death at their posts to retreat. The fighting in the region continued to the middle of May, in its last phases resulting in gain and loss of territory to both sides. The second great German thrust resulted in the occupation of about 800 square miles of territory held by the British and some Portuguese. However, the coast was not

reached and from that point of view the Allies might be considered as being saved from complete disaster.

In May and June the Germans put into action their plans for the forcing of the Aisne and the Marne, striking on a thirty mile front, which was later extended twenty miles farther toward Noyon. When the thrust came to an end it had brought them a distance of thirty miles, though their fighting front had contracted to six miles. The Germans began their offensive on May 27th, after heavy bombardment in the Ypres and Picardy salients, thus rousing fear of attack in those quarters. The forcing of the Chemin-des-Dames positions and the Aisne river, an apparent victory for the Germans, was later revealed as a remarkable piece of strategy on the part of Marshal Foch, who had thus put the Germans in a dangerous position. This was made clear in the middle of July when his plan for an attack on the western side of the Marne salient was revealed. This the Allies attacked on July 18 on a twenty-eight mile line W. of Soissons. Tanks on this occasion made artillery preparation unnecesary and the sudden counter-attack greatly astonished the Germans, who were driven across the Vesle. The Allies advanced some miles on both sides of the Ourcq, the entire German front from Château-Thierry to Soissons retreating, and at the end of a couple of days no German troops remained S. of the Marne.

Immense strength was given to the Allies in this attack by the American troops who formed the spearhead of the thrust. On the 21st American and French troops traversed the Marne and drove toward Ourcq. On the 23d the road running between Soissons and Château-Thierry had almost entirely fallen to the Allies. Following the disaster that had overtaken the British in March and April, they had been distributed along different parts of the front and in this attack Italian and British troops attacked the eastern side of the salient, while the Americans and Frenchmen drove forward advancing two miles N. of Château-Thierry, the French capturing Oulchy and taking forty square miles of new territory. The Germans began to fall back on the 27th to prepared positions, and on August 2 the French entered Soissons, and by that time the gains of the Allies could be counted up. They could not be compared to the results of the German drives of March and April, but they were a presage of what was to follow. Apart from the gain in territory, 35,000 prisoners and 500 guns had been taken.

On August 8 the Allies began a new attack on a front thirty miles long, curving N. from Montdidier. The French forces traversed the Avre river, supported the British on their left, and on the 13th Montdidier was taken, the French advancing a depth of six miles on a thirteen mile front. They struck again between the Matz and Oise rivers and took Canny. On August 20 French and American troops struck along a front between the Oise and the Aisne from Ribecourt to Soissons. The heavy attacks by the French and American troops depleted the Hindenburg line, and permitted the English to advance with small loss. During the last days of August and the first days of September the French advance went on, so that by the middle of September the Germans were fighting behind the Aisne near Vailly. More N. by September 6 French and Americans were once again in the positions held by the British before the German offensive that began on March 21. Lens was evacuated by the Germans on September 4, and the villages around were left to the Allies. Outside of Flanders and along the Aisne, the Germans had fallen back to their positions in March, and something like 200,000 prisoners and 2,300 guns had been taken by the Allies. It was the beginning of the end. Franco-Americans reduced the St. Mihiel salient, and the French railway system through Nancy, Toul and Verdun was liberated. In the last week of September Foch began an offensive on the entire front, making gains at numerous points, the French and Americans in the Argonne-Meuse district cutting the main German line of communication. An attack begun on September 29 brought the Allies toward Cambrai and on October 9 another attack resulted in the capture of Cambrai, one village after another falling till the British took Maubeuge and Mons, and the French took Hirson. November saw the breaking up of the Hindenburg line, and the armistice of November 11 came in due course.

It was the fighting in France that brought about the cessation of hostilities on all the other fronts. Elsewhere notable battles were being fought and important events being recorded. The Austrians in Italy had tried in June to repeat their success of the previous autumn and had failed. An Allied offensive in Albania in July had met with a counter-offensive by the Austrians which nullified it. An offensive in September by Allied forces under the leadership of General Franchet d'Esperey brought about the capitulation of Bul-

garia and the severing of communication between Turkey and the Central Powers. On November 3 an armistice amounting to surrender was signed with Austria-Hungary, after Italian forces late in October had won over the Austrians a victory almost as great as that won by the Austrians in 1917. October also saw the fall of Turkey, following the advances under General Allenby in Mesopotamia and Palestine. The armistice with the Turks went into effect on October 31. All these events presaged the collapse of Germany, who nevertheless still remained immeasurably more powerful than her Allies, and who from the beginning of the war up to a few months before had gone from victory to victory. On November 8 Marshal Foch opened negotiations with the German agents, the terms being accepted by Germany on November 11. The evacuation of the territory W. of the Rhine according to the terms of the armistice began from that date. On December 14 the terms of the armistice were renewed for a month, a provision being added by the Allied High Command reserving the right, as a new guarantee to occupy the neutral zone on the right bank of the Rhine, N. of Cologne to the Dutch frontier. In the months that followed gold, securities, and an enormous number of locomotives, railway cars, motor trucks, ships, and war material were surrendered to the Allies. For the participation of the United States in the war, see UNITED STATES. For the more important battles see under their titles, as PICARDY, BATTLES OF; AISNE; MARNE, BATTLES OF, etc. See also the articles on the various countries; PEACE TREATY, and related subjects.

WORMS, a town of Germany, in Hesse-Darmstadt; three-quarters of a mile from the left bank of the Rhine, 40 miles S. S. E. of Mainz. It is irregularly built, and is still in part surrounded with its ancient walls. The principal edifice in the town is the venerable cathedral (founded in the 8th century, completed and consecrated in 1101), a noble Romanesque structure with four elegant towers, two domes, and a double choir. The interior is 357 feet long, 87 feet wide (across the transepts 117 feet), and is very imposing from its grand simplicity. On the N. side of the cathedral is the site of the Bischofhof or episcopal palace, the seat of the diet of April, 1521. It was destroyed by the French in 1689, and again in 1794. On its massive red sandstone substructure the Heil'sche Haus has been erected in the rich Renaissance style. Outside the town stands the Liebfrauenkirche (dating from the 15th century), which gives its name to the *Liebfrauenmilch*, a much-esteemed wine grown in the vicinity. The finest monument in Worms is that to Luther, erected from Rietschel's designs in 1868, at a cost of $85,000. The principal industries of Worms are the manufacture of patent leather, tobacco, beer, soap, and amber wares. Worms is one of the most historical towns of Germany. It was known to the Romans as Borbetomagus, and later as Augusta Vangionum, the capital of the Vangiones. It was destroyed by Attila and rebuilt by Chlodwig in 486. After the partition of the empire among the sons of Ludwig the Pious, Worms became a German free town under the protection of the Elector of the Palatinate. Already in 1255 it belonged to the Confederation of Rhenish towns, and it contained in the time of Friedrich Barbarossa 70,000 inhabitants. It was the seat of many Imperial Diets, most famous that under Karl V., which Luther made memorable to the world. In 1632 the suburbs of the town were leveled by the Swedish Colonel Haubold, and in 1689, the town itself was ruthlessly destroyed by Melac and the young Duc de Créqui under the orders of Louis XIV. In September, 1792, part of it was leveled by the French under Custine, and at the peace of Lunéville in 1801 it was given to France. The peace of Paris in 1814 gave it back to Germany, and the Vienna Congress in 1815 to Hesse-Darmstadt. French troops occupied the town at the end of the World War in accordance with the armistice terms. Pop. about 50,000.

WORTH, a village in Alsace, at the confluence of the Sauerbach and Sulzbach rivers. It is celebrated as the place where the French on Aug. 6, 1870, met their first great defeat at the hands of the Germans in the Franco-Prussian War.

WORTH, WILLIAM JENKINS, an American military officer; born in Hudson, Columbia co., N. Y., March 1, 1794. He received but a scanty education, and on the breaking out of the War of 1812 he entered the army as a private soldier. He was appointed 2d lieutenant of infantry in 1813, was aide-de-camp to General Lewis the same year, and General Scott in 1814; and the same year received the brevets of captain and major for gallant conduct at the battle of Chippewa, July 5, and at that of Lundy's Lane, July 25, at which latter he was severely wounded. He was promoted major in 1832, and colonel in 1838. In 1841, he assumed the command of the Florida war, which he

brought to a successful termination after several severe conflicts. At the outbreak of the Mexican War, he joined the command of General Taylor, and distinguished himself at the storming of Monterey, for which he received the brevet of Major-General, and a sword from Congress. He also distinguished himself at Cerro Gordo, Puebla, Churubusco, the capture of Vera Cruz, Molino del Rey, and in the storming the San Cosmo gate of Mexico. At the close of the war he was placed in command of the Southwest. He was presented with a sword by the States of New York and Louisiana, and by his native county, besides a vote of thanks from Florida. He died in San Antonio, Tex., May 17, 1849. A monument was erected to his memory by the city of New York, where his remains are interred.

WORTHINGTON, HENRY ROSSITER, an American inventor; born in New York City, Dec. 17, 1817; early engaged in mercantile business with his father; but in 1840 began a series of experiments with steam for the propulsion of canal boats. Soon afterward he devised a small steam pump to be used in the maintenance of the water supply in the engine boiler, and in 1841 patented an independent feed pump which developed into the direct-acting steam pump that he patented in 1849. Subsequently he built in Savannah, Ga., the first direct-acting compound engine ever used in waterworks; erected a large plant for the manufacture of pumping machinery; invented the duplex pump, and devised various improvements in steam and hydraulic machinery. He died in Tarrytown, N. Y., Dec. 17, 1880.

WOTHERSPOON, WILLIAM WALLACE, an American soldier born in Washington, in 1850. He was educated in private schools, and in 1873 was appointed 2d lieutenant of the United States Infantry. He was promoted to be 1st lieutenant in 1879, captain in 1893, major in 1901, and lieutenant-colonel in 1904. In 1905 he graduated from the Army War College. He was appointed a brigadier-general in 1907, and major-general in 1912. From 1905 to 1909 he served on the general staff, and from 1907 to 1909 was president of the Army War College. He was assistant to the chief of staff in 1909-1910. From 1910 to 1912 he again served as president of the War College. He commanded the Department of the Gulf in 1912, and in the same year was appointed assistant to the chief of staff. From April to November, 1914, he was chief of staff. In the latter year he was retired.

WOTTON, SIR HENRY, an English diplomatist; born in Bocton Malherbe, Kent, England, in 1568; was educated at Winchester and Oxford. He resided on the Continent for some years, and on returning to England was employed as secretary to Essex. On the fall of that nobleman from power (1600) Wotton fled to Florence, where he was employed by the grand-duke to reveal to King James of Scotland a plot against his life. When the Scotch king ascended the throne of England he showed his gratitude by making Wotton a knight, employing him abroad as an ambassador and ultimately (1625) appointing him provost of Eton. His ability as a writer is shown in "Reliquiæ Wottonianæ" (Wotton's Literary Remains), published in 1651, with Izaak Walton's "Life of Wotton." He died in Eton, in December, 1639.

WRANGEL LAND, an island in the Arctic Ocean; lying N. of the E. extremity of the Asiatic coast, and intersected by the meridian of long. 180° E. It was seen by the Englishman Kellett in 1849, again discovered by the American Long in 1867, and named after the Russian explorer Wrangel (1796-1870), who sought in vain to reach it in 1821-1823. It was first explored by the American expedition under Hooper and Berry in 1881.

WREN, SIR CHRISTOPHER, an English architect; born in East Knoyle, Wiltshire, England, Oct. 20, 1632; was educated at Wadham College, Oxford; became a fellow of All Souls in 1653; was appointed Professor of Astronomy at Gresham College in 1657, and three years afterward was elected Savilian Professor of Astronomy at Oxford. He had been appointed by Charles II. to restore old St. Paul's, but after the great fire (1666) it became necessary to rebuild the cathedral. In preparing his plans he was considerably hampered by the ecclesiastical authority, but with the king's permission he modified and improved the design as the building proceeded. Thus, the division of the exterior into two orders of columns, and the present dome and drum on which it stands, were alterations on the original plan. The cathedral was begun in 1675, and the architect saw the last stone laid by his son 35 years afterward. Among the other notable buildings which Wren designed are: The modern part of the palace at Hampton Court, the library of Trinity College, Cambridge, the hospitals of Chelsea and Greenwich, the churches of St. Stephen's, Walbrook; St. Mary le-bow; St.

Michael, Cornhill; St. Bride, Fleet street; as also the campanile of Christ Church, Oxford. In 1680 he was chosen president of the Royal Society, appointed in 1708 surveyor of the royal works, and from 1685 to 1700 represented various boroughs in Parliament. He died in Hampton Court, Feb. 25, 1723. Over the N. doorway of St. Paul's is a memorial tablet on which are the well-known words: *"Si monumentum requiris, circumspice"* (If you demand a monument, look round). See SAINT PAUL'S.

WRIGHT, CARROLL DAVIDSON, an American statistician; born in Dunbarton, N. H., July 25, 1840. After distinguished service in the Civil War, he was a member of the Massachusetts Legislature in 1872-1873; afterward chief of the State Bureau of Statistics, lecturer at Harvard University, United States Commissioner of Labor, 1885-1902, and completed the 11th United States census; was Honorary Professor of Social Economics in the Catholic University of America (in 1895-1903); and Professor of Statistics and Social Economics, Columbian University (1900). Besides numerous addresses, pamphlets, and articles in reviews, he published: "Reports of Massachusetts Bureau of Labor" (15 vols. 1873-1888); "Census of Massachusetts" (1876-1877); "The Factory System of the United States" (1882); reports of the United States Commissioner of Labor, including "Industrial Depressions" (1886), "Convict Labor" (1886), "Strikes and Lockouts" (1887), and "Railroad Labor"; "Outline of Practical Sociology" (1899), etc. He was a leading authority on statistics. He died Feb. 20, 1909.

WRIGHT, HAROLD BELL, an American writer, born in Rome, N. Y., in 1872. He received an academic education, and from 1892 to 1897 he was a landscape painter. In the latter year he was ordained a minister of the Christian church, and served as pastor in several cities in Kansas, Missouri, and other States. He retired from the ministry in 1908. His first novel "That Printer of Udell's" (1903), was widely read. This was followed by "The Shepherd of the Hills" (1907); "The Calling of Dan Matthews" (1909); "The Uncrowned King" (1910); "The Winning of Barbara Worth" (1911); "The Eyes of the World" (1914); "The Re-Creation of Brian Kent" (1919). These books achieved a wider sale than those of any other American writer during the period in which they were written.

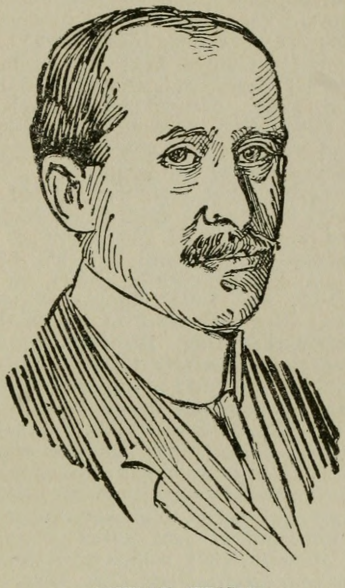
WRIGHT, HORATIO GOUVERNEUR, an American military officer; born in Clinton, Conn., March 6, 1820; was graduated at the United States Military Academy in 1841, and commissioned 2d lieutenant of engineers; for two years was instructor at the Military Academy; superintending engineer of the building of Fort Jackson, at Tortugas, Fla. (1846-1856); lighthouse engineer in Florida (1852-1853); assistant to the chief of engineers in Washington (1856-1861); promoted major, April 6, 1861. He served through the entire Civil War, with an exceptionally brilliant record for leadership; became Brigadier-General of volunteers, Sept. 14, 1861, and took command of the Department of Ohio in August, 1862; commanded a division at the battle of the Wilderness, May 5 and 6, 1864, and a corps at Spottsylvania Court House, May 9-12, and Cold Harbor, June 3; served as Major-General at the battle of Opequan Creek, Sept. 19, 1864, and contributed to the decisive victory at Cedar Creek, Oct. 19, 1864; received the brevet of Major-General in the United States army for his services at the capture of Petersburg, March 13, 1865; mustered out of the volunteer service, Sept. 1, 1866; returned to regular army duty as lieutenant-colonel of engineers, becoming Brigadier-General and chief of engineers, June 30, 1879, which rank he held at his retirement, March 6, 1884. He was co-author of "Report on the Fabrication of Iron for Defenses," and died in Washington, D. C., July 2, 1899.

WRIGHT, LUKE E., an American lawyer and public official, born in Tennessee, in 1846. He was admitted to the Tennessee bar, practiced law in Memphis, and served as attorney general of his native State for eight years. From 1900 to 1904 he was a member of the United States Philippine Commission, serving as its president from 1903 to 1904; from 1904 to 1906 governor-general of the Philippine Islands; from 1906 to 1907 United States ambassador to Japan; and from July 1908 to March 1909 Secretary of War in President Roosevelt's cabinet.

WRIGHT, MRS. MABEL (OSGOOD), an American writer on nature; born in New York, in 1859. She wrote: "The Friendship of Nature," a series of outdoor studies; "Birdcraft," a book on New England birds; "Tommy-Anne: A Natural History Story"; "Citizen Bird," a book for beginners; "The Dream Fox Story Book" (1900); "The Flowers and Ferns in Their Haunts" (1901); "The Open Window" (1908); "The Stranger at the Gate" (1913).

WRIGHT, ORVILLE, an American inventor, brother of WILBUR WRIGHT

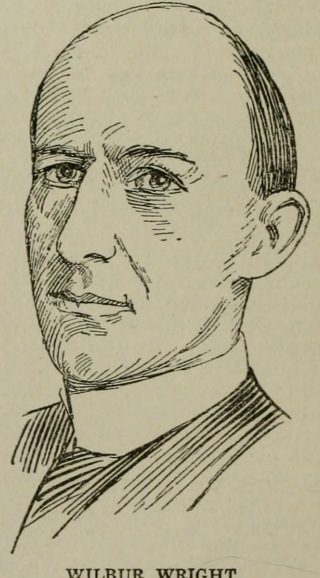
(*q. v.*), born in Dayton, O., in 1871. With his brother Wilbur, he was proprietor of a machine shop, and in 1903 became interested in the development of the flying machine. After months of study and experiment, they finally succeeded in actually flying, and followed this with perfecting a biplane of their own manufacture. Orville Wright made numerous flights in the United States and abroad, especially in France, where he and his brother were recognized as geniuses of a high order. In 1909 he was awarded a gold medal by the French Academy of Sciences, and received honorary degrees from several colleges. He organized the Wright Aeroplane Company, but in 1915 sold out his interests. He was awarded many trophies and prizes for the development of the aeroplane. He also invented other devices to be used on aeroplanes, including the automatic stabilizer. He was a member of many societies relating to aeronautics. See AERONAUTICS.



ORVILLE WRIGHT

WRIGHT, THOMAS, an English antiquary and historian; born near Ludlow, England, April 21, 1810. He was one of the founders of the British Archæological Association, and directed the excavation of Uriconium. A prolific worker, he wrote "Queen Elizabeth and Her Times" (1838); "Essays on the Literature, Popular Superstitions, and History of England in the Middle Ages" (1846); "Narrative of Sorcery and Magic" (1851); "Wanderings of an Antiquary" (1854); "Essays on Archæological Subjects" (1861); "Manners and Sentiments in England During the Middle Ages" (1862); "Caricature History of the Georges" (new ed. 1868); "Womankind in Western Europe" (1869); "History of Caricature and the Grotesque" (2d ed. 1875); "The Celt, the Roman, and the Saxon" (5th ed. 1890); etc. He edited "Early English Poetry" (1836); "Piers Plowman" (1842); "The Chester Plays" (1843-1847); "The Canterbury Tales" (1847-1851); "Works of James Gillray" (1873); etc. He died in London, Dec. 23, 1877.

WRIGHT, WILBUR, an American inventor, brother of ORVILLE WRIGHT (*q. v.*), born in Millville, Ind., in 1867. The work of the two brothers is so closely associated that it is impossible to relate it separately. He went with his brother to France in 1908, where he won the Michelin prize for sustained flight. During the Hudson-Fulton celebration he flew from Governor's Island to the Hudson river, which was considered a remarkable feat in those days. He received a gold medal from the French Academy of Sciences in 1909. He died in 1912. For a detailed account of the Wright brothers in the perfection of the aeroplane, see AERONAUTICS.



WILBUR WRIGHT

WRIGHT, WILLIAM ALDIS, an English editor, noted as a Shakespeare scholar; born about 1836. He was the principal contributor in Biblical geog-

raphy and biography to Dr. Smith's "Dictionary of the Bible" (3 vols. 1860-1863), and made an abridged edition. He edited Bacon's essays (1862), and his "Advancement of Learning" (1869); was coeditor with W. Clark, of the "Cambridge Shakespeare" (9 vols. 1863-1866), and the "Globe Shakespeare" (1 vol. 1864); and edited the "Bible Word-Book" (1866), Chaucer's "Clerk's Tale," the "Metrical Chronicle" of Robert of Gloucester, and other works. He died in 1914.

WUNDT, WILHELM MAX (vönt), a German physiologist and philosopher; born in Neckarau, Baden, Aug. 16, 1832. He was Professor of Philosophy at Leipsic after 1875. His works include: "Science of Muscular Motion" (1858); "Manual of Human Physiology" (4th ed. 1878); "Ethics" (2d ed. 1892); "The Human and the Animal Soul" (2d ed. 1892; in English, 1894); "Logic" (2d ed. 1892-1895); "Elements of Physiological Psychology" (4th ed. 1893); "System of Philosophy" (2d ed. 1897); "System of Psychology" (2d ed. 1897; in English, 1894); etc. As a physiologist he advanced psychology by his work. As a philosopher he introduced the inductive method into sciences previously purely speculative (*e. g.*, logic and ethics), and sought to advance psychology by exact measurements (as of the time needed by a nerve stimulation to reach consciousness and become a percept). He died in 1920.

WÜRTTEMBERG or **WÜRTEMBERG** (vür-tem-berg), a state of the former German empire, between Bavaria, Baden, Hohenzollern, and the Lake of Constance which separates it from Switzerland; area, 7,533 square miles; pop. about 2,600,000. Except a few tracts in the S. the surface is hilly and even mountainous. In the W., the Schwarzwald, or Black Forest, forms part of the boundary, and the Alb or Rauhe Alp, forming part of the Franconian Jura, covers an extensive tract. The country belongs in large part to the basin of the Rhine, being drained N. into that river by the Neckar, while the Danube flows across the S. districts. A part of the Lake of Constance is also included in Württemberg. The climate is decidedly temperate. In the lower and more favorable districts the fig and melon ripen in the open air, and the vine, cultivated on an extensive scale, produces several first-class wines; maize, wheat, hops, tobacco, and fruit, which is employed in cider making, are largely cultivated. About a third of the country is under forests, which consist chiefly of oaks, beeches, and pine. Of minerals, by far the most valuable are iron and salt, both of which are worked by the government; the others are limestone, gypsum, alabaster, slate, millstones, and potter's clay. The manufactures consist chiefly of cotton, woolen, and linen goods, paper, wooden clocks, toys, musical instruments, and chemical products. The government before the World War was a hereditary constitutional monarchy, the executive power being lodged in the sovereign, and the legislative jointly in the sovereign and a Parliament, composed of an upper and a lower chamber. In November, 1918, the State was proclaimed a republic. Its new constitution dates from September, 1919, and vests the supreme power in the Landtag of 101 elected members. The total revenue for the year ending March 31, 1920, was estimated at about $43,000,000, the expenditures at about $50,000,000, and, in 1918, the principal of the public debt was estimated to amount to about $170,000,000. In the Bundesrath Württemberg was, before the war, represented by four members, and in the Reichstag by 17. There is no exclusively established religion. Education is generally diffused; the center of the educational system is the University of Tübingen, which in the winter half-year 1914-1915 had 128 professors and teachers, and 2,056 students in theology, jurisprudence, medicine, and philosophy. Besides Stuttgart (the capital), the chief towns are Ulm, Heilbronn, and Esslingen.

The history of the state is of little general interest. Previous to the Napoleonic era the rulers had the title of duke, but in 1806, by the favor of Napoleon, the then duke gained a great accession of territory, as well as the title of king. In the subsequent arrangement of the European states by the Congress of Vienna the territorial accessions were confirmed and the kingly title formally recognized. In the war of 1866 Württemberg sided with Austria against Prussia. It became a member of the German empire on its foundation in 1871. See GERMANY.

WÜRZBURG (vürts'börG), a town in the N. W. of Bavaria, Germany; on the Main; 60 miles S. E. of Frankfort. Its old fortifications have been demolished, and the site laid out in fine promenades, but it is still overlooked by the fortress of Marienberg, on a lofty hill outside the city. The most important edifices are the Romanesque cathedral, erected in the 10th century, with an interior highly enriched but much deteriorated by plaster decoration of the 18th century; the university, with various new buildings; the

Julius hospital and school of medicine, and the royal palace (1720-1744). The manufactures before the World War were varied in character. Pop. about 90,000.

WU TING-FANG, a Chinese diplomatist; born in Hsin-hui, district of Kwangtung, China; studied Chinese literature and classics together with English in Canton, and took a law course in England in 1874-1877. On his return to China he directed the construction of the first railroad in his native land; was the first secretary of the Chinese commission to negotiate with Japan in 1895; and was afterward a plenipotentiary to ratify the treaty. He was appointed envoy extraordinary and minister plenipotentiary to the United States, Peru, and Spain in May, 1897. While residing in Washington he became very popular. In 1900 the degree of LL. D. was conferred on him by the University of Pennsylvania. He was the author of numerous articles on China in American magazines. He took a prominent part in the revolution which overthrew the Manchu dynasty, and was active in the political movements of the following years.

WYANDOTTE, a city of Michigan, in Wayne co., on the Detroit river and on the Michigan Southern, the Lake Shore and Michigan Southern, the Grand Trunk, and the Detroit, Toledo and Ironton railroads. It is an important industrial center and has manufactures of chemicals, salt, iron, steel ships, trunks, lumber, gasoline engines, automobiles, etc. There are a public library and a hospital. Pop. (1910) 8,287; (1920) 13,851.

WYATT, SIR THOMAS, an English courtier and poet; born in Allington Castle, Kent, England, in 1503; son of Sir Henry Wyatt, who stood high in favor with Henry VII., and later with his son. In 1515 he was entered at St. John's College, Cambridge, where he took his degrees of Bachelor and Master of Arts. He was warmly received at court, for he was one of the most accomplished men of his day, of a noble presence and fine manners, dexterous and subtle in the management of affairs, yet of spotless honor and integrity. In 1536 he was knighted, and the next year he was made high sheriff of Kent. He contrived to retain the hazardous favor of the king, and was frequently employed by him in positions of trust, as in missions to Spain, to the imperial court. In 1541 he was rewarded with a grant of lands at Lambeth, and the year after he was named high steward of the king's manor at Maidstone. He had now very much withdrawn himself from public life, and lived for the most part retired at Allington. Among the other accomplishments of Wyatt was that of verse, which he seems to have begun to cultivate early, and continued through life to practice. During his life he had acquired considerable reputation as a poet; and in 1557 his poems, with those of Surrey, were published in "Tottel's Miscellany" (ed. by Arber, 1870). As marking a stage in the progress of early English literature they hold a permanent place. He died in Sherborne, Oct. 11, 1542.

WYATT, SIR THOMAS, surnamed THE YOUNGER (to distinguish him from the preceding, of whom he was the only son), an English soldier; born about 1520. After a wild and riotous youth, he raised a body of men at his own expense, and did good service at the siege of Landrecies (1544), displaying considerable military talent; and he continued in honorable service on the Continent till 1550. In 1554, when the Spanish match was in agitation, Wyatt, in co-operation with Lady Jane Grey's father, led the Kentish men to Southwark, after gaining considerable successes over the royalists; but failing to capture Ludgate, he became separated from the main body of his followers, was taken prisoner, and soon after executed in London, April 11, 1554.

WYCLIF, WICKLIFFE, or **WICLIF** (the name is spelled in several ways), **JOHN**, an English reformer; born in the village of Ispreswel (later Hipswell), Yorkshire, England, between 1315 and 1320, the year 1324 assigned by Lewis and accepted by several subsequent biographers being too late to tally with other facts in his life. Of his childhood and youth no account has been preserved. He probably went to Oxford when a mere lad, and he certainly had a remarkable university career; but all details are wanting till 1356, when we find him (if there is not a confusion with another John Wyclif) seneschal of Merton College. In 1361 he was master or warden of Balliol, and though in May of the same year he was appointed rector of Fillingham in Lincoln, the university continued for a long time the main seat of his activity. About four years later, Simon Islip, Archbishop of Canterbury, appointed him (if this be not again the other Wyclif) warden of the new foundation of Canterbury Hall, but after Islip's death he was expelled by the monkish members, whose action was sanctioned by papal bull in 1370 and confirmed by royal decree in 1372.

Meanwhile he had become Professor (*i. e.*, doctor) of Theology. Lehler thinks



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it not improbable that he was a member of the famous Parliament of 1366, and at any rate he wrote about this time a tractate or dialogue in defense of the national policy toward the Pope. In 1374 he was one of the commissioners sent to Bruges to arrange a concordat, and about the same time he received from the king himself (Edward III.) the rectory of Lutterworth in Leicestershire. With Edward's younger son, John of Gaunt, Duke of Lancaster, he was in special favor; but this very favor was probably the proximate cause of the first hostile action of the clergy. Summoned before the Convocation in 1377, he was saved from all danger by the high-handed protection of the Duke of Lancaster and his friends, who made their way into the assembly and rendered all judicial proceeding impossible; and though in the following year a formidable process was instituted against him by direct command of Gregory XI., the papal commissioners were induced by the intercession of the Princess Joanna and the evident sympathy of the citizens to do no more than to forbid him further to disseminate his obnoxious doctrines. But in the course of the following years he grew more and more estranged from the orthodox creed, and his endeavors to propagate his opinions were of wider scope than before.

In 1378 the election first of Urban VI. and then of Clement VIII. produced a schism in the Church; each Pope condemned his rival as antipope, and Wyclif declared that they were both right, and that the papacy was Antichrist. He called in question the doctrine of transubstantiation, and declared that pilgrimages and monastic vows had no authority from Scripture. His views were accepted by numerous disciples, and disseminated by preachers through the length and breadth of the land. The ecclesiastical authorities endeavored to suppress the movement by fair means and foul; but though many of its leaders were silenced, the great originator of the whole continued to the end boldly to bear witness to the truth. Died in 1384.

WYCOMBE, a market town of Buckinghamshire, England; on the Wye; 25 miles E. S. E. of Oxford and 29 W. N. W. of London. Called variously Chipping (or Chepping), Wycombe and High Wycombe, it was the seat of a Saxon fortress, Desborough Castle, some remains of which may be seen, and has a fine cruciform parish church (1273-1522; restored 1874-1888) with a tower 96 feet high, a guildhall (1757-1859), etc. Wycombe was governed by a mayor in Henry III.'s time, but first incorporated by Henry VI.; the municipal boundary was extended in 1880. Pop. about 20,000.

WYE, a river of South Wales, which, rising from Montgomeryshire, near the Severn's source, and flowing generally S. E. between Radnor and Brecon, through Hereford, and between Gloucester and Monmouth, enters the Severn at Chepstow, 123 miles below its head. Rapid and rockbound as far as Hay, the Wye grows gentler as it gathers volume, but throughout is singularly beautiful, making innumerable horseshoe curves between wooded banks, and passing by Maeslough, Clifford, Cooderich, and Chepstow Castles, Hereford Cathedral, and Tintern Abbey.

WYMAN, WALTER an American surgeon; born in St. Louis, Mo., Aug. 17, 1848; was graduated at Amherst College in 1870, and at the St. Louis Medical College in 1873; was made assistant surgeon in the United States Hospital Service in 1876, and became chief medical purveyor of the quarantine division in 1888; was appointed supervising surgeon-general of the United States Marine Hospital Service in 1891. Under his management was one of the finest laboratories in the world, where diseases were constantly being scientifically investigated. He was an earnest advocate for the sanitation of ports not only in the United States but in the West Indies and South America, holding that if this were enforced yellow fever would be entirely eradicated from the Western Hemisphere. He was also interested in purifying water supplies; in the study of leprosy and tuberculosis; etc. On his recommendation the Government set apart a large tract of land in New Mexico for a hospital whence all consumptive patients in the United States marine hospitals could be transferred. He died in 1911.

WYNDHAM, SIR CHARLES, a British actor; born in 1837. He was educated in Germany, at St. Andrew's and in Dublin, studying medicine for some years. After fighting in the American Civil War, he went on the stage, making his first appearance in America with John Wilkes Booth, and in London, in 1865. He acted also in German. In 1876 he became lessee and manager of the Criterion Theater, London, England, and in 1899 built and opened with Mary Moore, Wyndham's Theater, in London. He was knighted in 1902.

WYOMING, a State in the western divisions of the North American Union; bounded by Montana, South Dakota, Nebraska, Colorado, Utah, and Idaho;

admitted July 10, 1890; capital Cheyenne; counties 14; area, 97,914 square miles; pop. (1890) 60,705; (1900) 92,531; (1910) 145,965; (1920) 194,402.

Topography.—The surface of the State is very rugged, being diversified by mountains, valleys, plains, and plateaus, the latter covered with grasses of great nutrition and furnishing admirable pasture for live stock. The main range of the Rocky Mountains enters the State from the S. terminating in the Wind River Mountains, with an altitude of from 10,000 to 14,000 feet, and snow-capped the entire year. The Shoshone Mountains extend N. of the Wind River range. Running S. from the N. boundary to the center of the State are the Big Horn Mountains. Other notable ranges are the Sweetwater, Rattlesnake, Medicine Bow, and Sierra Madre. The highest peak is Fremont's Peak, in the Wind River range, 13,790 feet. Other high points are Grand Teton Peak, 13,690 feet; Mount Sheridan, 13,691 feet, and Atlantic Peak, 12,700 feet. The principal rivers, are the North Platte, entering the State from Colorado; Green river flowing S. E. into Utah; Snake or Shoshone river, rising in Yellowstone Park, flows into Idaho; the Yellowstone; Big Horn; Cheyenne; Belle Fourche; and Powder. None of these streams are navigable in a commercial sense, but they furnish water for the irrigation and development of the surrounding country, and in some instances are used for the transportation of timber. There are several important lakes, including Yellowstone Lake in Yellowstone Park, the N. W. corner of the State; Jackson's; Shoshone; Lewis; Madison; Fremont; Boulder, and Uradisa.

Geology and Mineralogy.—The geological formations of Wyoming cover nearly every age, and though not thoroughly explored are known to contain at least the Tertiary, Carboniferous, Cretaceous, Eozoic, Silurian, Triassic, Jurassic, Devonian, and Volcanic. The mineral productions are quite extensive, including copper, gold and silver, coal, iron, oil, soda, and building stones. The oil belt extends entirely across the State from S. W. to N. E.

Mineral Production.—The coal production in 1919 was 7,100,000 tons, a decrease over the production of 1917 of over 2,000,000 tons. The production of petroleum in 1918 was 12,596,287 barrels, valued at $18,159,778. Iron ore is produced in considerable quantities. The production of natural gas in 1918 was 4,338,840 thousand cubic feet, valued at $156,171. A small amount of gold is produced, as well as stone and phosphate rock.

Agriculture.—The soil of the mountains and high plateaus is a light sandy loam; darker and richer in the valleys, slightly alkaline, but, under irrigation producing large crops. It is estimated that 10,000,000 acres of the State are suitable for agricultural purposes by irrigation. The acreage, production and value of the principal crops in 1919 was as follows: corn, 48,000 acres, production 768,000 bushels, value $1,267,000; oats, 315,000 acres, production 5,670,000 bushels, value $6,350,000; barley, 35,000 acres, production 525,000 bushels, value $919,000; wheat, 284,000 acres, production 4,008,000 bushels, value $8,497,000; hay, 605,000 acres, production 853,000 tons, value $19,619,000; potatoes, 33,000 acres, production 2,640,000 bushels, value $5,016,000.

Manufactures.—There were in 1914 337 manufacturing establishments, employing 2,989 wage earners. The capital invested was $29,270,000; the amount paid in wages $2,312,000; the value of materials used $5,560,000; and the value of the finished product $11,224,000. The chief manufactures included railroad cars and railroad supplies, lumber and timber products, saddlery and harness, tobacco, boots and shoes, millinery, brooms, flour and grist, lime and cement, and malt.

Banking.—On Oct. 31, 1919, there were reported 43 National banks in operation, having $2,350,000 in capital, $1,855,000 in outstanding circulation; and $6,827,000 in United States bonds. There were also 101 State banks, having $2,390,000 capital, and $868,000 surplus.

Education.—There were in 1918 48,429 children of school age in the State. The enrollment in the public schools was 38,271, with an average daily attendance of 27,960. The teachers numbered 1,965. There is a normal school, which is connected with the University of Wyoming, at Laramie. The University also includes an Agricultural College, School of Mines, College of Mechanical Engineering, School of Music, and a Department of Home Economics.

Churches.—The strongest denominations in the State are the Roman Catholic; Methodist Episcopal; Lutheran, General Council; Protestant Episcopal; Presbyterian; Congregational; Regular Baptist; and Mormon.

Finances.—The receipts for the fiscal year 1917-1918 were $3,041,549, and the disbursements $2,404,903. There was a balance on hand of $2,058,894 at the end of the year. The bonded debt amounts to about $100,000, and the assessed valuation of real estate is about $300,000,000.

Charities and Corrections.—The in-

stitutions under State control include hospitals at Evanston, Rock Springs, and Sheridan; the penitentiary at Rawlins; Soldiers' and Sailors' Home at Buffalo: School for Defectives at Lander; Big Horn Hot Springs Reserve at Thermopolis, and an industrial institute at Worland.

Railroads.—The railway mileage in the State is about 2,000. The Union Pacific, the Chicago, Burlington and Quincy, and the Chicago and Northwestern railroads have the longest mileage.

State Government.—The State officers are elected for a term of four years. The legislative sessions are held biennially in odd years, beginning on the second Tuesday in January, and are limited in length to 40 days each. The Legislature has 27 members in the Senate and 57 in the House, each of whom receives $5 per day and mileage. There is one Representative in Congress.

History.—The greater part of the area of Wyoming was included in that of the Louisiana Purchase of 1803, though the W. section formed part of the Oregon settlement. It was organized as a Territory July 25, 1868, from what was then the S. W. portion of Dakota, the N. E. part of Utah, and from the E. part of Idaho, to which the name of Wyoming was given. This territory was admitted to the Union as a State July 10, 1890. The oldest white settlement within its confines was Fort Laramie, on Platte river, which was made a fur trading post in 1834, rebuilt by the American Fur Company in 1836, sold by them to the United States and garrisoned as a fort in 1849. It was long an important base of operations against the Indians, though it is now abandoned. Settlement took place very slowly till recently, the Indians occupying the more fertile districts. As the latter were removed, settlement became more rapid. The N. W. corner of the State, remarkable for its natural beauties and wonders, has been set aside as the Yellowstone National Park.

WYOMING, UNIVERSITY OF, a coeducational, non-sectarian institution in Laramie, Wyo., founded in 1886; reported at the close of 1919: Professors and instructors, 56; students, 913; president, A. Nelson, Ph. D.

WYOMING VALLEY, a valley in Luzerne co., Pa., famous as the scene of a massacre following the battle of Tory and Indian invaders, on one side, and the American settlers on the other, July 3, 1778. The American force was weak, nearly all the fighting men being away in the Continental army, and more than half of it was killed. The survivors took refuge in Forty Fort, where most of the families of the valley had gathered. The Tories under Colonel Butler, offered unexpectedly easy terms of surrender, and the settlers went back to their homes, while the invaders were supposed to be leaving the valley. Against the commands of their white leaders the Indians remained, and, on the night of July 4, began massacring the inhabitants and burning the houses. All who could escape made their way into the Wilkesbarre Mountains and the swampy land beyond, where so many women and children died that it was afterward called "The Shades of Death." When peace was established and the Indians came under control, the surviving settlers returned. They were confirmed in the possession of the valley about 1787.

WYTHE, GEORGE, a signer of the Declaration of Independence; born in Elizabeth City, Va., in 1726; was educated at William and Mary College; studied law and became eminent in that profession; was chosen to the Virginia House of Burgesses in which he became a leader. He was author of a paper remonstrating against the Stamp Act, which was adopted after being modified. In 1775 he was sent to the Continental Congress and affixed his name to the Declaration of Independence on July 4, 1776, as a representative of Virginia. He was made speaker of the Virginia House of Delegates in 1777, and the same year became a judge in the Court of Chancery of Virginia. He was Professor of Law at William and Mary College in 1779-1789, and a delegate to the Constitutional Convention of 1787. He was the author of "Decisions in Virginia by the High Court of Chancery, with Remarks Upon Decrees by the Court of Appeals" (1795). He died in Richmond, Va., June 8, 1806.

WYTTENBACH, DANIEL (vit'tenbah), a Dutch scholar; born in Bern, Aug. 7, 1746; studied at Marburg, Göttingen, and Leyden; became Professor of Greek at the Remonstrant Gymnasium at Amsterdam in 1771, of Philosophy at the Athenæum in 1779, and succeeded in 1799 to Ruhnken's chair of rhetoric at the university. His greatest work is the edition of Plutarch's "Morals," with rich annotations and an admirable "Greek Index to Plutarch's Works" (Oxf. 8 vols. 1795-1380). He retired in 1816, and died after some years of blindness in Osgeest, Jan. 17, 1820. His wife, Johanna Gallien, a niece of Hanau, whom he married at 72, was a remarkably accomplished woman. She lived after her husband's death at Paris.

X

X, x, the 24th letter of the English alphabet. It is superfluous, as it represents no sound which cannot be expressed by other letters. Thus, when used at the beginning of a word it has precisely the sound of z; when occurring in the middle of a word it usually has the sound of ks, as in axis, taxes, forces, etc.; it also has the same sound in some cases when terminating a word, as lax, wax, etc.; when it terminates a syllable, and more especially an initial syllable, if the syllable following it is open or accented, it frequently has the sound of gz, as in luxury, exhaust, exalt, exotic, etc. As an initial it occurs only in words of Greek origin, or formed from Greek words, most of these formations being of a scientific or technical nature.

X as a symbol is used in numeration: For 10, in this case being composed of two Vs (5) placed one above the other, the lower one being inverted. When placed horizontally it stands for 1,000 and with a dash over it, it represents 10,000.

In ordinary writing X is frequently used as an abbreviation for Christ. In this case the symbol is not the same letter as the English X, but represents the Greek X (Ch), as in Xn=Christian, Xmas=Christmas.

XANTIPPE, wife of Socrates, and the typical female termagant or scold. Most of the stories about her are probably false; for in ancient Athens gossip was cultivated to the perfection of a fine art, and the point and not the truth of the story was the chief consideration. Xantippe had probably some little acerbities of temper, and these must have been heightened by the peculiarities of her spouse, especially his indifference to the commonplace duty laid on the head of the house to make both ends meet. Socrates received her reproaches with such good-humored indifference that we cannot wonder she sometimes resorted to other weapons besides her tongue; as on the occasion when she is said to have finished up a tirade by sousing the philosopher, though his remark, as he moved dripping from the scene, that when Xantippe thundered she watered, must have convinced her that here, too, she was powerless. Some authors have given Socrates a second wife, named Myrto, but the story is undoubtedly false.

XANTIPPUS, a Lacedæmonian general; went to the support of the Carthaginians in 255 B. C.; and defeated the Romans under Regulus at Tunes (now Tunis). Notwithstanding his services, the Carthaginians ordered the captain in his ship to throw him into the sea.

XAVIER, FRANCISCO, a Spanish missionary and saint of the Roman Catholic Church, usually styled the Apostle of the Indies; born of a noble family, whose family seat of Xavier lay to the N. W. of Pampeluna, April 7, 1506. At the College of Sainte Barbe, in Paris, he attained while still young some importance as a lecturer on philosophy; but a friendship which he formed with his fellow countryman Loyola, turned his attention in a new direction, and he became one of the first members of the Society of Jesus. In the early part of 1540, before the Society had received papal approbation, he was chosen for the mission to India, and received the title of apostolic nuncio from Paul III. The rest of his life was consecrated with high-souled devotion to the work of an evangelist. From Goa, his headquarters, where he arrived in May, 1542, he extended his labors S. to Ceylon, Malacca, and Celebes. The last two years of his life were spent in Japan, where he met with remarkable success, and he was on his way to China when he fell ill with fever, and was abandoned to his fate on the island of Sancian by the shipmen with whom he sailed. He expired Dec. 2, 1552. His body was conveyed to Goa, where it remains in the Church of the Bom Jesus. Once in a century it is shown to the people on the saint's day,

Dec. 3. The last occasion was in 1878. Xavier was canonized in 1622, and in 1747 Benedict XIV. declared him the Protector of India.

XENIA, a city and county-seat of Greene co., O.; on Shawnee creek, and on the Pittsburg, Cincinnati, Chicago, and St. Louis, the Cincinnati, Hamilton, and Dayton and the Pennsylvania railroads; 55 miles S. W. of Columbus. Here are a United Presbyterian Theological Seminary, Wilberforce University for Colored Students (A. M. E.), State Soldiers' and Sailors' Orphans' Home, court house, churches, public libraries, National banks, and daily, weekly, and monthly periodicals. The city has twine and cordage plants, pump, paper, carriage, and shoe factories, marble and granite works, saw and planing mills, etc. Pop. (1910) 8,706; (1920) 9,110.

XENOCLES (zen'ō-klēz), a Greek tragic poet; born in Athens, in the 4th century B. C., in the time of Philip of Macedon. He obtained a prize for four plays, "Œdipus," "Lycaon," the "Bacchantes," and "Athamas."

XENOCRATES (zē-nok'ra-tēz), a Greek writer and philosopher; born in Chalcedon, in 396 B. C.; removed in early youth to Athens, where he joined Plato. He was for some years scholarch, or rector, of the Academy. His writings were numerous, chiefly on metaphysics and ethics, laying special stress on the latter, and working on Platonic lines. He is said to have first divided philosophy into physics, didactics, and ethics. He died in Athens, in 314 B. C.

XENON, the name of an element discovered in 1898 by Professor Ramsay and Dr. Morris Travers when making the experiments with liquid air which resulted in the finding of neon and crypton. Its spectrum resembles that of argon, while furnishing different lines.

XENOPHANES (ze-nof'a-nēz), a Greek writer and philosopher; born in Colophon about the third or fourth decade of the 6th century B. C. Exiled from his Ionian home, he established himself at Elea in southern Italy. He is the reputed founder of the Eleatic philosophy, and his teachings found expression in both elegiac and epic poems, the most important being "On Nature" and "Satires." He died at the age of 92, in Elea.

XENOPHON, a Greek historian, and philosopher; born about 430 B. C. At an early age he became a pupil of Socrates, and is said to have been saved from death by that philosopher at the battle of Delium. About the age of 40 he joined the expedition of the younger Cyrus against his elder brother, Artaxerxes Mnemon, King of Persia. After the battle of Cunaxa, and the treacherous massacre of the Greek generals, Xenophon played an important part in the adventurous retreat known in history of the "Retreat of the Ten Thousand"; and it was his courage and conduct that contributed mainly to its success. He afterward settled at Scillus, a small town near Olympia, in Elis, under Spartan protection, where he lived upward of 20 years, occupying himself with hunting, agriculture, and writing. At last he was driven from his retreat at Scillus by the Eleans, and took refuge in Corinth. His works are numerous, and, to judge by their titles and number, all extant. His principal works are the "Anabasis," or narrative of Cyrus' expedition and the "Retreat of the Ten Thousand"; a "History of Greece," in continuation of Thucydides; the "Cyro-



XENOPHON

pædia," or education of Cyrus the Elder, a historical romance; "Reminiscences (Memorabilia) of Socrates"; the "Symposium," a sequel to the Memorabilia; the "Economics." He wrote also a manual of cavalry instruction, a treatise on horsemanship, etc. He died after 357.

XENOPHON OF EPHESUS, called XENOPHON THE YOUNGER, a Greek writer who lived in the 2nd century of the Christian era. One work of his has been preserved, a story in five books, called "Ephesiaca; or The Loves of Abrocomas and Anthia."

XERES, FRANCISCO (hār'ās), a Spanish historian, who lived in the 16th century, accompanying Pizarro, as his

secretary, to Peru, about 1530. Of that expedition he wrote a detailed history, entitled "A True Account of the Conquest of Peru" (1549), still considered of great value as a source of information.

XERES, or JEREZ DE LA FRONTERA, a town in southwest Spain, the Asta Regia of the Romans, and the seat of the wine trade in Spain, of which the principal wine is that so well known in England as sherry, an English corruption of Xeres. Xeres is a handsome and large town, of great antiquity. At the battle of Xeres, July 26, 711, Roderic, the last Gothic sovereign of Spain, was defeated and slain by the Saracens, commanded by Tarik and Muza. Pop. about 65,000.

XERXES I., King of Persia; the eldest son of Darius and his second wife, Atossa; was appointed successor by his father, in preference to Artabazanes, his eldest son by his first wife, whose children were born before Darius became king. Darius died in the beginning of the year 486 B. C., in the midst of his preparations for a third expedition against Greece. Xerxes, after having subdued the rebellious Egyptians, and appointed his brother, Achæmenes, governor, gave his whole attention to the completion of the preparations begun by his father, which occupied nearly four years. Immense hordes of men were gathered together from all parts of the vast Persian empire, from the steppes of central Asia, from the banks of the Indus and its tributaries, and from the interior of Africa; an enormous fleet was furnished by the Phœnicians and other maritime nations subject to Persia; stores of provisions sufficient to support the immense army were collected at different points along the intended route of march. A bridge of boats, an English mile in length, under superintendence of Egyptians and Phœnicians, was built across the Hellespont. The bridge, however, was destroyed by a storm. Another bridge, consisting of a double line of boats, was built, and a canal was cut through Mount Athos, at the point of the peninsula of Acte, in Macedonia, on which the fleet of Mardonius had been wrecked in 492 B. C. The preparations were completed in 481 B. C., and in the autumn of the year Xerxes arrived at Sardis, where he wintered.

The following spring the vast assemblage began to march toward the Hellespont. It took seven days and nights to march across the bridge. After crossing the Hellespont, the march was continued along the Thracian coast toward Doriscus, on the Hebrus, where a halt was made on a large plain, and the army numbered. The fleet drew up near to Doriscus. According to Herodotus, the whole number of fighting men, military and naval, amounted to nearly 2,500,000, and the fleet consisted of 1,200 ships of war, besides 3,000 smaller vesels. These numbers were considerably increased during the march between Doriscus and Thermopylæ by the Thracians, Macedonians, Magnesians, and other nations through whose territory Xerxes passed on his way to Greece. Herodotus supposed that the number of people assembled on this occasion would be over 6,000,000. This immense force moved on without resistance through submissive nations till it reached Thermopylæ, where it was brought to a stand by the army of Leonidas.

Though the Greeks were entirely defeated and slain, it was not without heavy loss to the Persians. On the same day, and on the third day after, the Persian fleet, which had previously suffered severely from a storm, was defeated with heavy loss by the Greeks off Cape Artemisium, in Eubœa. Xerxes continued his march on to Athens through Phocis, which he laid waste, and Bœotia, whose inhabitants joined him, with the exception of those of Platæa and Thespia, which cities he burned. A detachment which he sent to attack Delphi met with a signal defeat. When Xerxes arrived at Athens (in the summer of 480, three months after crossing the Hellespont) he found the city deserted, the Athenians having sent their families to Trœzen, Ægina, and Salamis. Athens was destroyed. Meantime the two fleets had sailed round from Eubœa, and taken up their positions in the narrow strait between Salamis and the Attic coast, where the famous naval battle of Salamis took place (September, 480 B. C.). Xerxes witnessed the fight from a lofty throne which he had caused to be erected on a slope of Mount Ægaleus. He was apparently confounded at the unexpected and inglorious result of all his mighty preparations to subdue Greece, and fled under the escort of 60,000 men. Little more is known of him, except that in 465 B. C. he was murdered.

XIMENA, the site of a battle in southern Spain, between the Spanish army under the command of General Ballasteros, and the French corps commanded by General Regnier, Sept. 10, 1811. The Spaniards defeated their adversaries; the loss was great on both sides.

XIMENES, JACQUES (hē-ā'nas), a Spanish poet, living in the 16th century.

He took part in the war of the Netherlands; wrote a poem, "The Invincible Knight, the Cid Ruy Diaz of Bivar" (1579); and left a collection of sonnets.

XIMENES DE CISNEROS, FRANCISCO, a Spanish cardinal and statesman; born of a noble though poor family, in Tordelaguna, Castile, in 1430. He studied at the University of Salamanca, where he took the degree of bachelor both of civil and canon law. In 1455 he went to Rome where he pleaded the cause of his countrymen in the consistorial courts with such success that he attracted the attention of the then pontiff. He returned in 1461 with an expective, which gave him a right to the first ecclesiastical preferment in a certain see that should fall vacant. A suitable office did fall vacant in 1473, but Carillo, Archbishop of Toledo, wished to fill it with a creature of his own. Ximenes refused to surrender his rights, whereupon the enraged prelate shut him up in prison for six years. Ximenes refused to yield, and at last attained his right. Preferments of one kind and another followed; but he finally determined to leave the ranks of the secular for those of the regular clergy. He became a Franciscan, one of the straightest of sects.

But in vain he attempted to escape from the world. He was appointed guardian of the convent of Salzeda, in 1492 chaplain to Queen Isabella, and in 1495 chaplain of Toledo. He was now an old man of 60, but more than a lifetime's work lay before him. He engaged in important civil and clerical reforms, and these his determined energy enabled him to carry through in the face of much opposition. He founded the University of Alcalá (1500), endowed it magnificently, and made provisions therein for the encouragement of every liberal art. He collected a body of learned men and a vast number of important manuscripts, and with such aid he compiled the famous polyglot Bible known as the "Complutensian Polyglot," a work which took 15 years, and cost a vast sum of money. He projected also an edition of Aristotle, but this his manifold labors did not allow him to complete. He violently converted a large number of the "infidels" of Granada to the "true faith," and he carried on a victorious campaign against the Moors of northern Africa.

On May 17, 1507, he was appointed cardinal, and when Ferdinand died in 1516 he ruled as regent for the young Carlos (afterward known as Karl V.) the whole of Spain. Here his prudent care disarmed the hostility of Ferdinand, the younger brother of Carlos (a youth whose pretensions to the crown were favored by many of the people), reconciled a discontented nobility, filled the royal treasury, and maintained the army and navy in a high state of efficiency. His regency lasted about two years. Then Carlos left the Netherlands for Spain. Almost his first act of sovereignty was the dismissal of the faithful regent. Ximenes was already on his deathbed, and it is doubtful if he ever knew of the act of the king. He died in Toledo, Nov. 8, 1517.

XINGÚ (shēn-gö′) a river of Brazil; one of the chief tributaries of the Amazon; it rises near lat. 15° S., lon. 59° W., and after flowing N. for 1,300 miles joins the Amazon 240 miles W. of Pará. Steamers can ascend it for 100 miles.

XIPHIAS, in ichthyology, a genus of *Xiphiidæ*, distinguished by the absence of ventral fins. The best known species is *X. gladius*, the common or Mediterranean swordfish. Günther says that the distinction of species is beset with great difficulties because the form of the dorsal, the length of the ventrals, and the shape and length of the sword change according to the age.

X-RAY. See ROENTGEN RAYS.

XYLENE, or **XYLOL** (C_8H_{10}), one of the aromatic hydrocarbons, being a homologue of benzene (C_6H_6), and sometimes known as dimethyl-benzene from the supposition that it is formed from benzene by the substitution of two molecules of methyl (CH_3) for two hydrogen atoms. It is a colorless liquid, boiling at 140° C. When passed through a red-hot tube xylene is resolved into a mixture of several homologous hydrocarbons.

XYLOPHONE (zy′lo-fōn), a musical instrument consisting of bars of wood or glass graduated in length and resting on belts. The notes are produced by striking on the bars with small hammers.

X. Y. Z. CORRESPONDENCE, in United States history, the name given to the dispatches of the three commissioners to France, Marshall, Pinckney, and Gerry, containing the insulting demands made by Talleyrand and the other French Directors as the price of respect and courtesy to the American republic. In the otherwise complete copies published by Congress President Adams substituted X. Y. and Z. for the names of Talleyrand's emissaries. To the demands the United States representatives returned a decided refusal. It is said that Pinckney, in response, made use of the phrase, "Millions for defense, but not once cent for tribute."

Y

Y, y, the 25th letter of the English alphabet, in modern English, both a consonant and a vowel. It is taken from the Latin, into which language it was adopted from the Greek (v) or upsilon. It sometimes represents an Anglo-Saxon character which is supposed to have a sound resembling that of the French *u* or German *ü*.

At the beginning of syllables, and when followed by a vowel y is a palatal consonant, being formed by bringing the middle of the tongue in contact with the palate, nearly in the position to which the g hard brings it. Hence, the Anglo-Saxon hard g has often been softened to y, as in day=Anglo-Saxon *dag*, may=Anglo-Saxon *mag*, etc. In words of Romance origin y frequently represents:

(1) French -ie=Latin -ia, as in barony, company, copy, jolly, family, memory, victory, etc. (2) Latin -ium, as augury, horology, remedy, study, etc. (3) Latin -atus, as attorney, deputy, ally, quarry. (4) French -if; Latin -ivus, as hasty, (=Old French *hastif*), jolly (=Middle English *jolif*; Old French *joli*, fem. *jolive*), testy, etc. (5) Many words ending in y have come through Latin nouns in -ia (=French -ie), from Greek -ia, -eia, as analogy, apology, blasphemy, philosophy, etc. (6) As an adjective termination, y generally represents the Anglo-Saxon -ig, as in stony=Anglo-Saxon *stánig*, hungry =Anglo-Saxon *hungrig*. So also in some nouns it represents Anglo-Saxon -ig, as in honey=Anglo-Saxon *hunig*. In the suffix, -ly, it is both an adjectival and an adverbial suffix, and represents the Anglo-Saxon -ic, -ice, or -iche, as godly= Anglo-Saxon *godlic*, friendly=Anglo-Saxon *freóndlic*, hardly=Anglo-Saxon *heardlice*. In nouns ending in -ty, this ending represents the French -té, Latin =tatem (nominative- tas), as in vanity (=French *vanité*, Latin *vanitatem*, accus. of *vanitatus*), calamity, etc.

In the middle, and at the end of words, y is a vowel, and is precisely the same as i. When accented it is pronounced as i long, as in dē-fy, dy'ing, etc., and when unaccented as i short, as in glŏry, jŏl-ly, cĭt-y, etc. Y is sometimes called the Pythagorean letter, from its Greek original in its form of three limbs representing the sacred triad formed by the duad proceeding from the monad. In chemistry, Y is the symbol of yttrium. As a numeral, it stands for 150, and with a dash over it for 150,000. Y- is a common prefix in Middle English words, and represents the Anglo-Saxon -e or ge-, as in *yclept*, *yclad*. It is the same as ge-.

YACHT (yät), a decked pleasure vessel; a light and elegantly fitted-up vessel, used either for racing or for pleasure trips, or as an official or state vessel to convey royal personages or government officials from place to place. The rigs are various, and many pleasure yachts now have steam power as an accessory, or for use during calms. Racing yachts are built with very fine lines, enormous spars and sails, and have the hull deeply ballasted, thus sacrificing everything to speed. Yachts appear to have been used by the Dutch in the 16th century, and the English probably borrowed the idea from that nation. In 1604 such a vessel was built for Prince Henry of Whales and in 1660 and subsequently several were built for Charles II.

The use of steam has been a great factor in the increase of interest in private yachts.

The first recorded yacht race was one in which a vessel of Charles II. defeated a Dutch racer and one belonging to the Duke of York. The course was from Greenwich to Gravesend and back, and the stake 100 guineas ($500). The oldest British yacht club was formed at Cork, Ireland, and dates back at least to 1720. In 1812 the Royal Yacht Club of Eng-

land was organized. The New York Yacht Club, an outgrowth of a Hoboken sailboat club, was started with nine members. In the first stated match sailed by the club, the schooner "Cygnet" won. Little attention was paid in the United States to the building of yachts till 1846, when Commodore Stevens and his brother Edwin A. Stevens, built the "Maria." This vessel was the largest sloop-rigged pleasure craft up to that time. It was at first intended to send her to the World's Fair at London, in 1851, but the "America," designed by George Steers of New York, and built by the Stevens brothers, was ultimately chosen. Commodore Stevens crossed the Atlantic in the "America," and entered her in the race of Aug. 22, open to all yachts, for a $2,500 cup. The course was around the Isle of Wight and the "America" beat the whole field of 18 yachts by about 7 miles. On Aug. 28 she sailed a race with the English schooner "Titania" over a 40-mile course winning an overwhelming victory. The achievements of the American yacht had a marked effect on the work of British ship-builders. It was not till 1870 that an effort was made to regain the "America" cup. For a record of the races from 1870 to 1920 for that trophy see AMERICA'S CUP. On Sept. 28, 1901, the "Columbia" defended the cup against the "Shamrock II.," winning by 1 minute, 20 seconds in a race of 4 hours, 30 minutes, 24 seconds. Oct. 3, 1901, the same boats competing, a race of 3 hours, 12 minutes, 35 seconds, was won by the American yacht by 3 minutes, 35 seconds. In the race on the following day, the British yacht finished first in a race of 4 hours, 32 minutes and 57 seconds, but on a time allowance of 43 seconds, the "Columbia" won by 41.

In 1903, Sir Thomas Lipton challenged for the third time, in the name of the Royal Ulster Yacht Club, of Cork, Ireland. The New York Yacht Club named the latter part of Aug. as the time for the races. Aug. 22, the first decisive race was run, the New York Yacht Club boat being the "Reliance," built by the Herreshoffs, the English boat being the "Shamrock III." In this and in the two succeeding races, "Reliance" won. In 1920 Sir Thomas Lipton again challenged with the "Shamrock IV." The defender was the "Resolute," which from July 15th to 27th, 1920, won five out of seven races sailed.

Several trans-Atlantic races have tested the seagoing qualities of modern yachts. In 1866 the schooners "Henrietta," "Fleetwing," and "Vista" raced from Sandy Hook to the Needles, Isle of Wight, for stakes amounting to $90,000. The "Henrietta" won in 13 days, 21 hours, 55 minutes, averaging 9½ knots for 3,106 miles, The "Fleetwing" sailed 3,005 miles, and the "Vista" 3,046 miles. On July 4, 1890, the schooners "Cambria" and "Dauntless" raced from Old Kinsale Head, Ireland, to Sandy Hook. The "Cambria" won. She sailed 2,881 miles in 23 days, 5 hours, 17 minutes. The "Dauntless" sailed 2,783 miles in 23 days, 7 hours. The schooners "Coronet" and "Dauntless" sailed a match race for $10,000 a side in 1887. The start was made off Bay Ridge, Long Island, on March 12, and the race ended at Queenstown, Ireland. The "Coronet" won. She sailed 2,949 miles in 14 days, 23 hours, 30 minutes. The "Dauntless" sailed 2,947 miles in 16 days, 1 hour, 43 minutes. In 1921 King Albert of Belgium awarded prizes for a series of races across the Atlantic for sailing vessels of all classes. A race between American and Canadian fishing vessels was held on Oct. 30-Nov. 1. off Halifax. The American schooner "Esperanto" defeated the Canadian "Delawana" in two races.

Among the designers of American and British racing vessels John Harvey and Beavor-Webb, of England, George Lennox Watson and William Fife, of Scotland, and Edward Burgess and N. G. Herreshoff, of New England, have been especially prominent.

YAK, the native name for the *Poephagus grunniens*, a species of ox from the mountainous regions of Tibet. There are two races: the wild yak, generally black, which is found near the snow line, descending into the valleys in winter, and a domesticated race of various colors, black and white being most common. The yak is about the size of the common ox to which it has a general resemblance, but it is covered with a thick coat of long, silky hair, hanging down like the fleece of a sheep, completely investing the tail, and forming a lengthy fringe along the shoulders, flanks, and thighs. This fringe, which exists in both races, was apparently developed as a protection to the animal in its alpine haunts, as the long hair forms a sort of mat which defends the body from the effects of the cold when the animal is reposing in the snow. The domesticated race is of great importance to the natives of Tibet. The yak is employed as a beast of burden, but never for tillage or draught; the milk is very rich, and yields excellent butter; the flesh is of the finest quality, and that of the calves far superior to ordinary veal. The hair is spun into ropes, and made into coverings for tents, and the soft fur of the

hump and withers is woven into a fine strong cloth. The tails, often dyed red, are made into the chowries or fly-flappers, used in India. Yaks are often seen in zoölogical gardens and menageries, and have repeatedly bred in Europe, and it is probable that they might be advantageously introduced into the Highlands of Scotland and the N. parts of the Continents of America and Europe.

YAKIMA, a city of Washington, the county-seat of Yakima co., formerly known as North Yakima, on the Southern Pacific, the Oregon-Washington Railroad and Navigation Company, and other railroads. It is the center of an important live stock and lumbering region and has a hospital, a public library, Federal buildings, and excellent school buildings. Pop. (1910) 14,082; (1920) 18,539.

YAKIMA, a river of Washington, rising in the Cascade Mountains, and flowing S. E. into the Columbia, which it joins about 10 miles above the mouth of the Snake river. Its valley is irrigated, and is one of the most fertile in the State. The Yakima traverses a region with important coal mines. Length, about 175 miles.

YAKOUB KHAN, Ameer of Afghanistan; born in 1849; son of Shere Ali; was nominated heir to the throne of Kabul in 1864. Appointed governor of Herat, he became extremely popular, and succeeded in maintaining his father's authority in that province when the rest of Afghanistan passed under the rule of the rival ameers, Afzul and Azim. It was owing to his admirable generalship that Shere Ali regained his throne in 1868, and when the latter visited India in the following year, Yakoub Khan was appointed governor of the capital. In 1870 he was made governor of Kandahar, and afterward was sent a second time to Herat, where, however, his great influence excited the fears and suspicions of Shere Ali, who now declared his youngest son, Abdullah Jan, to be his heir, and sought to prejudice the British Government against Yakoub Khan, by falsely representing him as hostile to British interests. Captain Marsh, who visited him at Herat in 1872, found him exactly the reverse. In 1873 Shere Ali recalled him from Herat, but he declined to return, and for a year was practically in revolt. At length, under the most sacred pledges of safety, he proceeded to Kabul, but was treacherously imprisoned, and was only released when the flight of his father before the victorious advance of the British arms in the war of 1878 made his presence indispensable to prevent anarchy in the capital and the state. On the death of Shere Ali he succeeded to the throne, and on May 30, 1879, concluded a treaty of peace with the British. Shortly after the murder of Cavagnari in the following September, in which he was suspected of complicity, he fled to the army that General Roberts hurried forward to punish the Kabul assassins, was detained a prisoner by the Indian Government; and was deposed in 1880.

YAKUTSK, a city and capital of the province of Yakutsk, Siberia; on a branch of the Lena river, 4 miles from the main stream. The city was founded in 1632 as a Cossack station and is the seat of the governor and provincial authorities. It has regularly laid out streets, wooden houses, a cloister cathedral, a pro-gymnasium for boys and girls, and several primary schools. It is the trading center of northern and eastern Siberia, and carries on an extensive commerce in hides, furs, tallow, fish, mammoth bones, and reindeer. Before the World War a great fair was held here annually from June 22 to Aug. 13, frequented by the natives from all over the province. Pop. about 10,000.

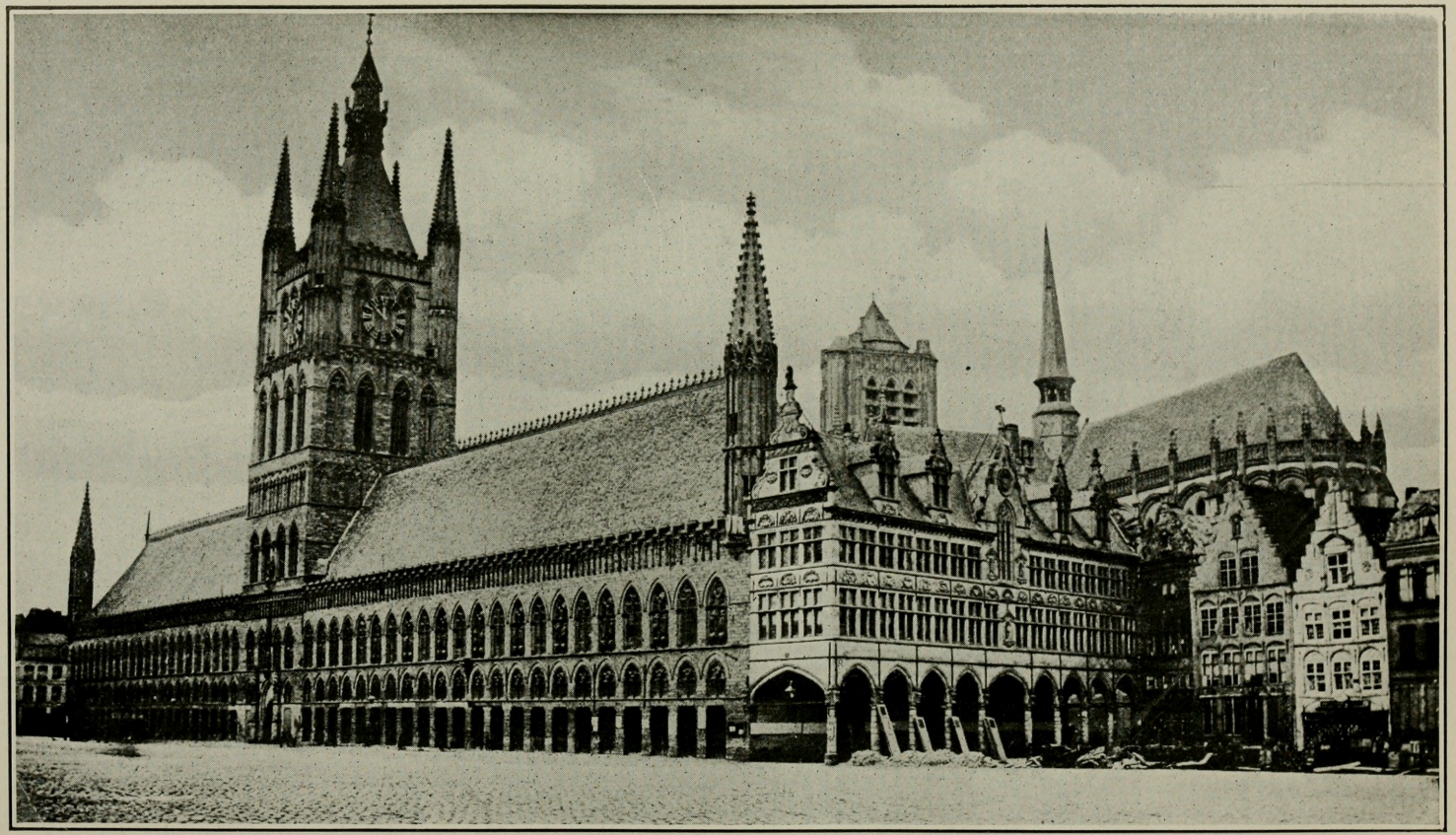
YAKUTSK, a province in east Siberia, Russia, embracing the valley of the Lena river; bounded by the Yeniseisk, Irkutsk, Transbaikal, and Amur provinces, by the Arctic Ocean, and by a narrow strip of the district of Ochotsk. The population consists mainly of Yakuts, Yukagirs, and Tunguses, occupied in hunting, fishing, and as nomads overseeing large herds of cattle and horses. The country is rugged, consisting mainly of an elevated plateau, covered with forests and marshes. These marshes are frozen to a depth of several hundred feet. The forests abound in fur-bearing wild animals; the rivers with fish. Gold mining is carried on extensively in the S. W. Yakutsk is the largest Siberian province, embracing nearly one-third of Siberia, and is nearly as large as European Russia; area, 1,533,397 square miles; pop. about 400,000.

YALE, ELIHU, an Anglo-American philanthropist; born in Boston, Mass., April 5, 1648; son of an English colonist. He went to England while very young and was there educated, never returning to America. About 1678 he went to the East Indies as a trader, and acquired great wealth. From 1687 to 1692 he was governor at Fort St. George, Madras. He gave to the Saybrook Collegiate School books and money valued at $4,000, a gift which resulted in the connection



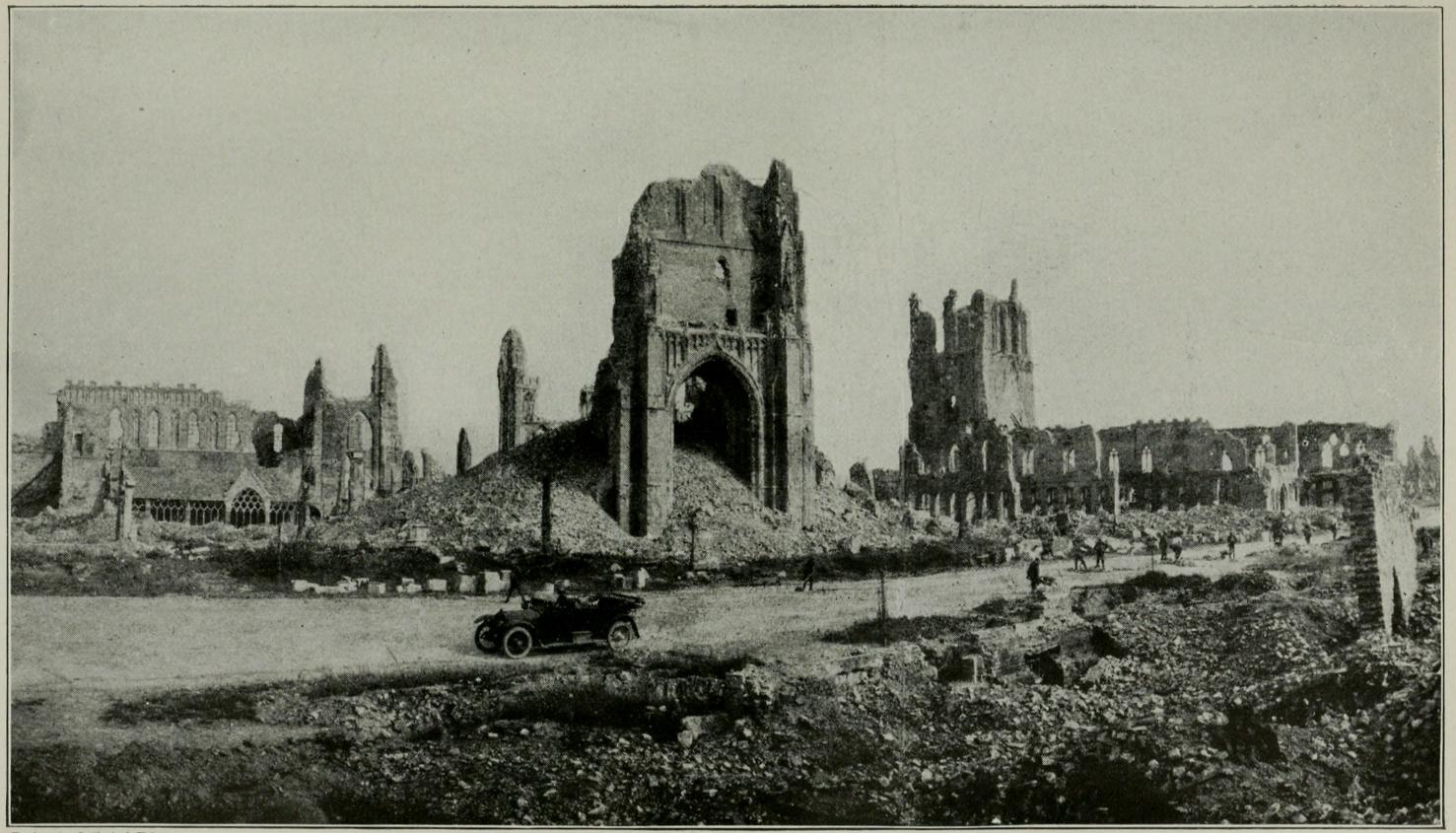
Photo, British and Colonial Press

CANADIAN TROOPS IN THE OCCUPIED TERRITORY ON THE RHINE. FROM THE PAINTING BY SHELDON WILLIAMS



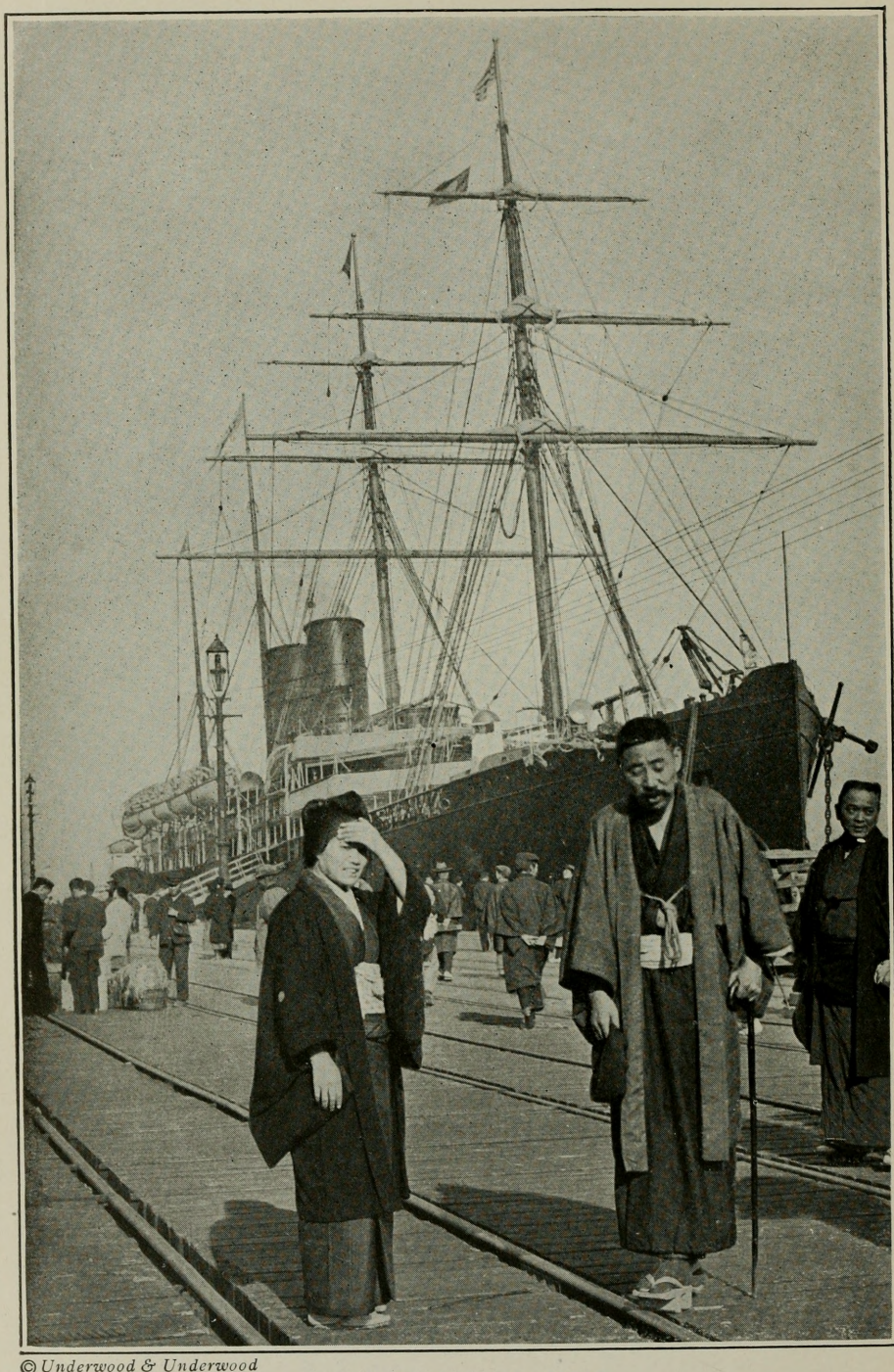
©*Photo, Central News Photo Service*

A PICTURE, MADE BEFORE THE WAR, OF THE FAMOUS CLOTH HALL OF YPRES, BELGIUM, BEGUN IN THE YEAR 1200. BEHIND IT IS THE CATHEDRAL. AT THE RIGHT IS THE HOTEL DE VILLE



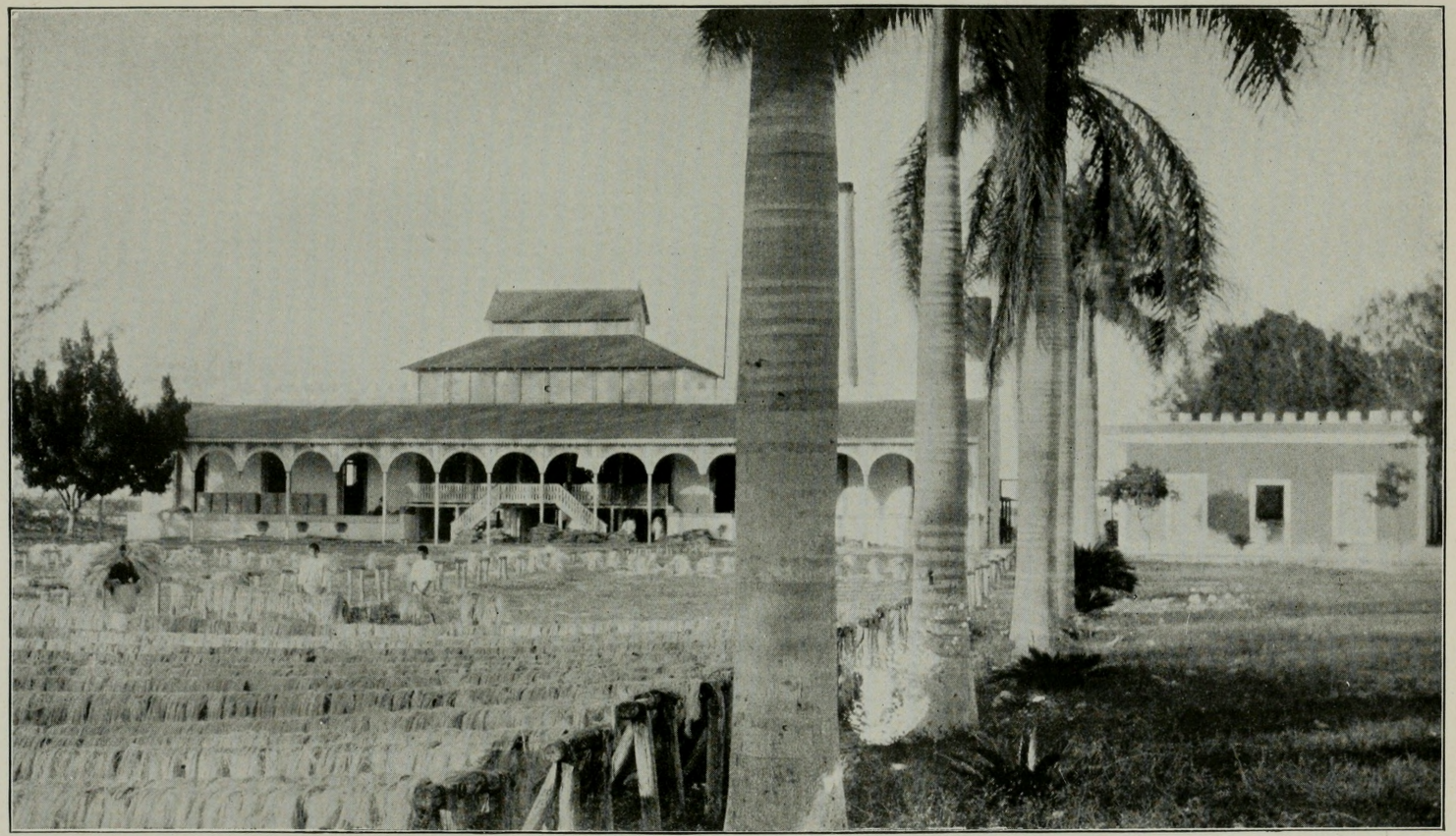
British Official Photo

YPRES AT THE CLOSE OF THE WAR. IN THE CENTER IS THE CATHEDRAL TOWER. AT THE RIGHT, THE CLOTH HALL



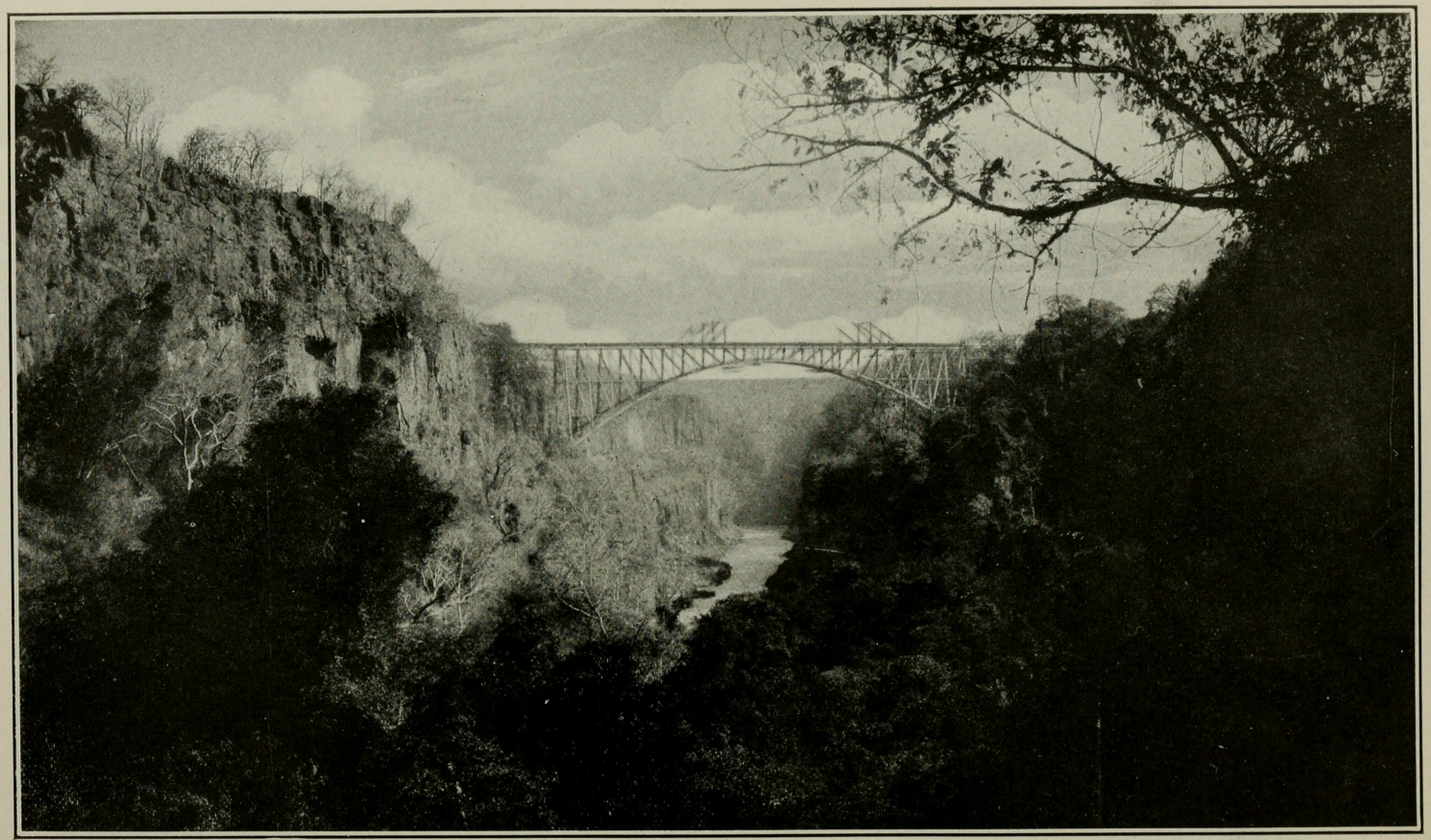
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PORT OF YOKOHAMA, JAPAN



© Ewing Galloway

THE SISAL DRYING YARD AND BUILDINGS ON A YUCATAN PLANTATION



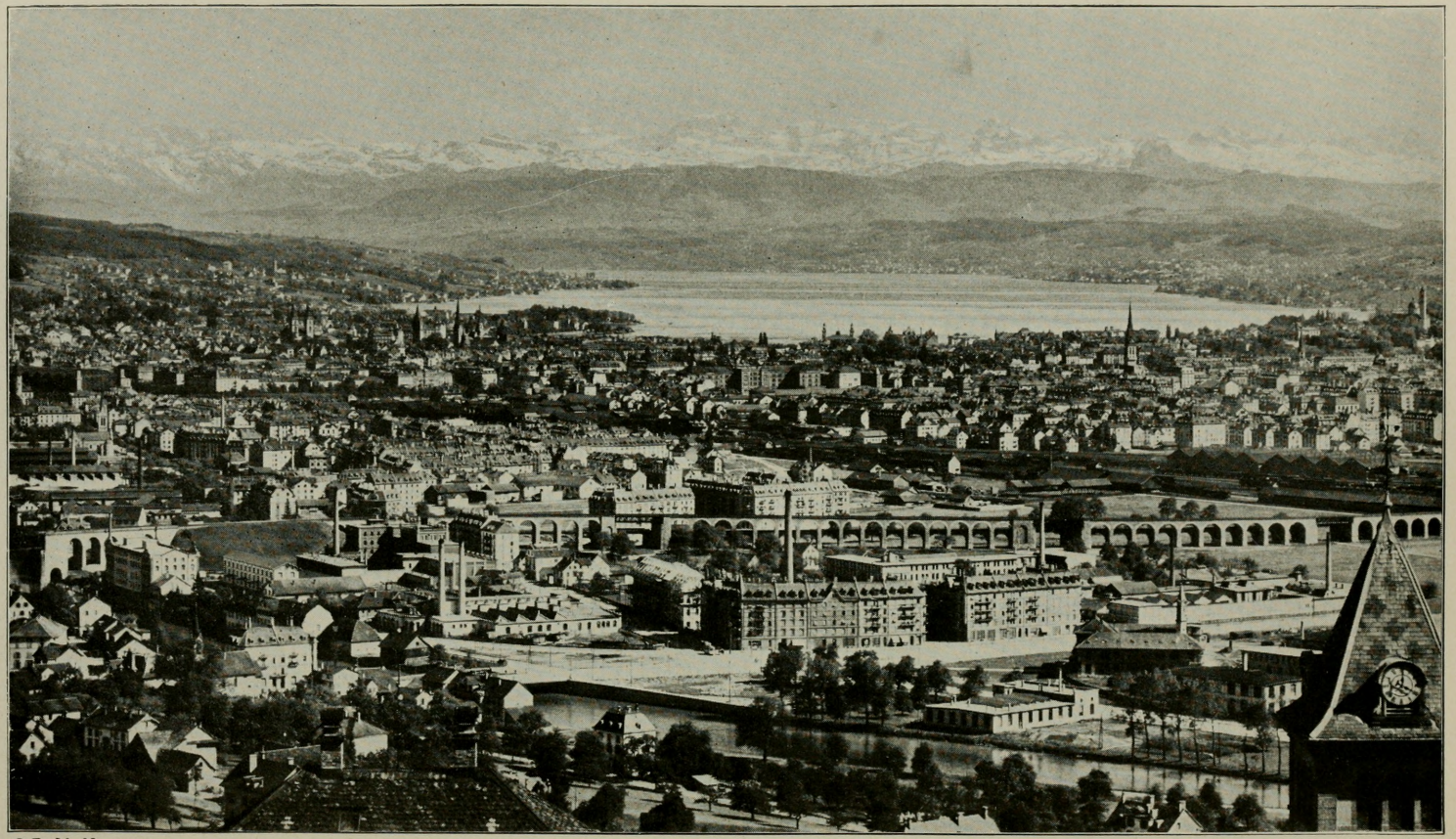
©Photo by George Grantham Bain

THE FAMOUS RAILWAY BRIDGE OVER THE ZAMBEZI RIVER, SOUTH AFRICA, NEAR VICTORIA FALLS



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ZULU WARRIORS EXECUTING A WAR DANCE



©E. M. Newman

ZURICH, LAKE ZURICH, AND THE ALPS, SWITZERLAND

of his name with the college after its removal to New Haven. His full-length portrait hangs in Alumni Hall, Yale University. He died in London, July 8, 1721, but was buried at Wrexham, Wales. His epitaph contains the following well-known lines:

"Born in America, in Europe bred,
In Africa travel'd, and in Asia wed,
Where long he liv'd and thriv'd; at London dead."

YALE, LINUS, an American inventor; born in Salisbury, N. Y., April 4, 1821; applied himself for a while to portrait painting, but in 1850 began to study mechanical problems. In 1851 he patented a safety lock, and thereafter till his death was a recognized authority on all matters pertaining to locks and safes. In the course of his work he became convinced of the necessity of abandoning the use of a key-hole as affording an easy means of introduction to the lock mechanism. This led to the adoption of a permanent dial and shaft as used in the combination locks, and subsequently to the perfection of what is known as the "clock" lock. His most notable invention was the double lock, which comprised two locks within a single case, and operated by the same or different combinations. He was the recipient of gold, silver, and bronze medals as first awards at various expositions. He died in New York City, Dec. 24, 1868.

YALE UNIVERSITY, an institution of higher learning in New Haven, Conn.; founded in Saybrook in October, 1701, as the Collegiate School of the colony under the trusteeship of 10 principal ministers. The classes were taught, however, at Killingworth, now Clinton, an adjoining town, till 1707. The institution was permanently settled in New Haven in 1716, and in 1718 its name was changed to Yale College in honor of Elihu Yale. The name Yale College applied at first only to the new building. It was given formally to the institution in its charter of 1745. The chair of Divinity was added in 1755, and another of Mathematics, Physics, and Astronomy in 1771, though this was not permanently filled till 1794. Occasional grants were made to it by the legislature before the Revolution, and $30,000 was voted by the State in 1792. Schools of Medicine (1812), Theology (1822), and Law (1824) were established; and, as reorganized in 1871, the university possesses also departments of Philosophy and Arts, the latter including besides the classical course of "Yale College" proper, the Sheffield Scientific School (begun 1847, endowed 1868), post-graduate courses, and a School of Fine Arts (1864). A great part of the studies in the third and fourth years is elective. The University Library, including Linonian Brothers' Library, the Law Library, the Sheffield Scientific School Library, the Trowbridge Reference Library of the Divinity School, the Lowell-Mason Library of Music, the Library of Foreign Missions and Art, the Medical School and American Oriental Society Libraries, consists of over 1,000,000 volumes and pamphlets. The numerous buildings cover about nine acres in the heart of the city, the oldest dating from 1752. The Trumbull gallery consists of historical portraits and works numbering 54 pictures. The Jarvis Gallery of Italian Art has 122 paintings, dating from the 11th to the 17th centuries. The Alden collection of Belgian wood carvings of the 16th century comprises about 150 feet of wainscoting and three confessionals from the Chapel in Ghent and a collection of about 50 paintings.

In March, 1887, an act passed the General Assembly of the State authorizing the use of the title Yale University by the president and fellows of Yale College. The president is the presiding officer of the Board of Trustees and of every board of instruction. He has no required duties of teaching. There are nine schools, each under a separate faculty: the College, the Sheffield Scientific School, the Graduate School, the School of Medicine, the School of Religion, the School of Law, the School of Fine Arts, the School of Music, and the School of Forestry.

The Library, the Peabody Museum of Natural History, and the Observatory are severally organized independently of the special departments, and are designed to contribute, in their appropriate spheres, to the instruction and advancement of the whole institution.

In recent years the university has developed in all departments. Several new university laboratories, including the Osborn Memorial Laboratories and the Sloane Physics Laboratory, have been erected. The Memorial Quadrangle, the gift of Mrs. Stephen H. Harkness of New York City, provides rooms for approximately 650 under-graduates, and is said to be the most beautiful group of college buildings in the United States. On March 19, 1919, the Yale Corporation adopted a new scheme of university organization, which, among other things, called for the establishment of several new administrative offices, including the provost and dean of students; instituted a common freshman year for Yale College and the Sheffield Scientific School; centralized in a Board of Admissions the

matter of entrance requirements; and extended the course in the Sheffield Scientific School from three to four years. There were in the fall of 1920 3,324 students and 532 members of the faculty. The endowment amounted to $24,048,738. In addition, the university is the beneficiary under the will of the late John W. Sterling of approximately $20,000,000, to be used for memorial buildings and for the foundation of scholarships, fellowships, or lectureships, and the endowment of new professorships.

The following is a list of the presidents since its foundation: Abraham Pierson (1701-1707); Samuel Andrew (1707-1714); Timothy Cutler (1719-1722); Elisha Williams (1726-1739); Thomas Clap (1740-1766); Napthali Daggett (1766-1777); Ezra Stiles (1777-1795); Timothy Dwight (1795-1817); Jeremiah Day (1817-1846); Theodore D. Woolsey (1846-1871); Noah Porter (1871-1886); Timothy Dwight (1886-1899); Arthur T. Hadley (1899-1921); James R. Angell (1921—).

YALU, the estuary of the most important of Korean rivers, variously called Yalu, Am-nok, or Oryoku. This navigable river flows 300 miles S. W. to the bay of Korea, and its mouth was on Sept. 17, 1894, the scene of a great naval battle, in which a Chinese fleet was defeated by a Japanese force. The first important battle of the Russo-Japanese War resulted from the crossing of the Yalu by the Japanese on May 1, 1904.

YAM, the name given to the fleshy tubers of several species of *Dioscorea* extensively used for food in many tropical and subtropical countries, where they are also largely cultivated.

YAMAGATA, ARITOMO, PRINCE, a Japanese military officer; born in the province of Choshu in 1838. He took an active part in the revolution of 1868, and under the new government won promotion in both military and official life. In 1869 he was sent to Europe to study French and Russian military institutions. He took a prominent part in the Satsuma rebellion in 1877; was put in command of the imperial guard; became head of the general staff; and was prime minister from 1889 to 1891 when he became minister of justice. He commanded the 1st Army Corps in the war with China in 1894, and for his success in expelling the Chinese from Korea was made a marquis. In 1896 he was a guest of the Russian court at the coronation of the czar, and visited the United States on his return. He was a man of progressive ideas and was energetic in the reorganization of the Japanese army according to European models. In 1907 he was made a prince.

YAMASKA, a river in the province of Quebec, Canada, rising in Brome Lake, Brome county, flowing in a W. direction to West Farnham, Missisquoi co., thence N. emptying into Lake St. Peter, an expansion of the St. Lawrence river. The river flows 100 miles through a very fertile region and passes the towns of Granley, Cavansville, Waterloo, St. Hyacinthe, and Farnham.

YANÁON (Yanám), a small tract in India, belonging to France, and under the governor of Pondicherry, forming a district surrounded by British territory (province of Madras) with about 9 square miles of area. It lies near the mouth of the Godavari, between the main stream and its branching mouth, the Coringa. Pop. about 6,000.

YANCEY, WILLIAM LOWNDES, an American statesman; born in Ogeechee Shoals, Ga., Aug. 10, 1814; went to Alabama in his youth, and there studied law and began to practice in Montgomery. For a while he was engaged in journalism, and afterward served in both branches of the Alabama legislature. He was a member of Congress in 1844-1847, and while there exerted a strong influence as a leader of the Pro-slavery party in the South. As early as 1858 he advised the organization of committees of safety all over the cotton-growing States. He reported the Alabama ordinance of secession to the convention in Montgomery, which was adopted in January, 1861. In February following he was appointed a Confederate commissioner to the governments of Europe to obtain the recognition of the Confederate States. He entered the Confederate Congress early in 1862, and served till his death, near Montgomery, Ala., July 28, 1863.

YANGTZE-KIANG, the chief river of Asia; popularly known as the "Girdle of China"; uniting all the central provinces of that country. It lies between Tibet and Kokonor on the W. and the Pacific Ocean on the E., and, including its many windings, has an estimated length of 3,400 miles. Its source is found in the elevated region of central Asia, and it flows first S. through a level country and then S. E. through the province of Yun-nan, and finally N. by E. with several turns to the S. If its many tributaries, their fertile valleys, and the vast population they support, be considered, the Yangtze-Kiang is the greatest river in the world.

YANKTON, a city and county-seat of Yankton co., S. D.; on the Missouri

river, and on the Great Northern, the Chicago, Milwaukee and St. Paul, and the Chicago and Northwestern railroads; 61 miles N. W. of Sioux City, Ia. Here are Yankton College (Cong.), a high school, the State Hospital for the Insane, waterworks, electric lights, National, State, and savings banks, and daily, weekly, and monthly periodicals. It has an extensive general trade, and is the supply depot for the Indian agencies and military stations along the Upper Missouri. There are planing mills, large Portland cement works, flour mills, foundry, woolen mill, pork packing establishments, etc. Pop. (1910) 3,787; (1920) 5,024.

YANKTON COLLEGE, a coeducational institution in Yankton, S. D.; founded in 1881 under the auspices of the Congregational Church; reported at the close of 1919: Professors and instructors, 25; students, 433; president, Rev. Henry K. Warren, LL. D.

YANTIC, a river in eastern Connecticut. It unites with the Shetucket and Quinnebaug rivers about 3 miles S. of Norwich to form the Thames river. It has a swift current and affords excellent water power, which is extensively used by the mills and factories along its banks.

YAP, an island belonging to the Caroline group in the North Pacific Ocean, situated about 500 miles S. W. of Guam and belonging formerly to Germany. There is on Yap a cable station of the Commercial Pacific Cable Company. A cable connects Shanghai and Yap, where it joins the main line running between Celebes and San Francisco. In February, 1899, Germany purchased from Spain for $3,300,000 the group of islands to which Yap belongs, with the exception of Guam, which was ceded to the United States in the treaty of peace that ended the Spanish-American War. Japan was given a mandate over the island in March, 1921, but the United States refused to relinquish any rights held prior to the World War.

YAQUIS (yä'kēz), the Indians who inhabit the S. part of the State of Sonora, Mexico, in the district of Guayamas. In the time of Cortez they are said to have numbered 300,000; but are now reduced to about 15,000, of whom not more than 5,000 are able-bodied men. The Yaquis have always been at war with the Spaniards and Mexicans, and while often defeated have never been conquered. They revolted against Spain in 1735 and in 1825, and against the Mexicans in 1832, each time being overcome. In 1841 they made another attempt and for years held the government at bay. Order was restored by a compromise. War broke out again, however, and from 1848 till 1897, when a treaty was concluded at Ortiz, scarcely a year passed without a conflict between the Mexican troops and the Indians. In the summer of 1899, the Yaquis again broke out and a fierce struggle ensued. They were well armed with Winchester rifles and fought desperately, but gained no permanent success. The Yaquis, according to those who know them best, are much superior in intelligence to other Indians. They are industrious, and during the building of the Southern Pacific railroad worked faithfully. They saved the money so earned and invested it in rifles and ammunition. They are a pastoral people, but in a rude way are somewhat skilled in the arts. They are ruled by their own laws, follow their own customs, and are strongly attached to their ancestral pagan faith. They are naturally hospitable, kind to their families, and very brave.

YARD, in ordinary language, the British and American standard of measure, being equal to 3 feet or 36 inches. As a cloth measure the yard is divided into four quarters=16 nails. A square yard contains 9 square feet, and a cubic yard 27 cubic feet. A yard=91,4382 centimeters, a square yard=8,361.13 square centimeters, and a cubic yard= 764,535 cubic centimeters.

As a nautical term, a spar slung from a mast and serving to extend a sail. Yards are either square, lateen, or lug sail. Yards for square sails are suspended across the mast at right angles, and are of a cylindrical form, tapering from the middle, which is termed the slings, toward the extremities, which are called the yard arms.

YARKUND, or **YARKAND**, the chief town of the province of the same name in eastern Turkestan; 140 miles S. E. of Kashgar. It is a great emporium of trade between China and the W., but it has been repeatedly devastated by the internecine wars which are chronic in central Asia. The bulk of the inhabitants are Mohammedans of the Turki race; and in 1866 it was captured from the Chinese by Yakub Beg, who in 1874, entered into a commercial treaty with the British in India, and caravans of traders annually pass to and fro through the valley of Kashmir. The exports are chiefly shawl wool, raw silk, gold, and borax; the imports are piece goods, metal wares, tea, and indigo. In 1876 an English company sent its goods direct to Yarkund under European conduct, and Yarkund merchants annually

go down to the Punjab. The soil of the province, which is watered by the Yarkund river, a tributary of the Tarim Kul, which flows E. into the lake called Lob Nor, is fertile; the crops are wheat, rice, barley, millets, fruits, and mulberry; and there are large herds of sheep, goats, cattle, and horses. Pop. about 70,000.

YARMOUTH, or, as it is more strickly called GREAT YARMOUTH, an English seaport, important fishing station, watering place, and municipal and parliamentary borough, in the county of Norfolk, 20 miles E. of Norwich; on a long and narrow tongue of land running from N. to S. between the German Ocean and the estuary of the Yare. The town is connected by a bridge with Little Yarmouth, or South Town, in Suffolk. Along the sea frontage stretches a promenade and carriage drive for three miles, with two piers. Parallel with the N. and S. quays, extending for nearly a mile and a quarter, are the principal streets, crossed by numerous narrow lanes called "rows." The parish church of St. Nicholas, founded in 1101, and of late years completely restored, is one of the largest in the kingdom. Yarmouth has a naval lunatic asylum. It is the great seat of the English herring and mackerel fishery, and also furnishes large quantities of white fish. The curing of herring as "Yarmouth bloaters" is an important industry. The coast is dangerous, but Yarmouth Roads between the shore and a range of sandbanks offers a safe anchorage. Pop. about 55,000.

YARMOUTH, a town and port of entry of Yarmouth co., Nova Scotia; on the Bay of Fundy, the Atlantic Ocean, and the Dominion Atlantic railroad; 90 miles S. of St. John, N. B. The town has extensive fishing, shipping, and manufacturing interests, Yarmouth Seminary, schools, daily and weekly newspapers, electric lights, and street railways. Pop. about 7,000.

YARN, any textile fiber prepared for weaving into cloth. Cotton yarn is numbered according to the number of hanks contained in a pound of 7,000 grains. Each hank, or skein, measures 840 yards. Worsted yarn has 560 yards to the skein; woolen yarn has 1,600 yards to the skein or run. Linen yarn is wound upon reels, and made up into leas, hanks, and bundles. Flax and jute yarn is numbered according to the number of leas of 300 yards per pound.

YAROSLAV, or **JAROSLAV**, a province of European Russia; bounded by the provinces of Novgorod, Vologda, Kostroma, Vladimil and Tver. The surface is level and well watered by the Volga and its tributaries, the Mologa and Sheksma. The W. portion of the province has numerous ponds and marshes, the largest being Lake Nero, near Rostov, from which the Weska flows. The Volga is connected with the Neva by two canals through which considerable commerce was carried on before the World War. Market gardening, timber cutting, mining, and manufacturing were the chief occupations. There were extensive linen and cotton mills, and factories for the manufacture of chemicals, machinery, metal ware, flour, tobacco and spirits, making Yaroslav one of the principal manufacturing provinces of Russia. Considerable commerce was carried on by the two railway lines, the Rybinsk-St. Petersburg and the Yaroslav-Moscow-Vologda. Area, 13,751 square miles; pop. about 1,200,000.

YAROSLAV, a city and capital of the province of Yaroslav, Russia; at the confluence of the Kotorost and Volga rivers; 173 miles N. E. of Moscow. It is the seat of the provincial government and of an archbishop. The city is largely engaged in manufacturing and commerce, the right bank of the Volga being lined for 2 miles with quays. There were, before the World War, numerous cotton and linen mills, silk factories, and bell foundries. The village of Velikoje Selo, included in the city, was the center of the linen manufacture of Russia, and had an annual output valued at $3,000,000. The city is the seat of Uspenskij Cathedral, begun in 1215, and has numerous other very old churches, several monasteries, schools, gymnasia, a theological seminary, and a lyceum with a law faculty. The left bank of the Volga is the suburban and residential portion of the city and contains many beautiful dwellings. Pop. about 75,000.

YARRA-YARRA, the Australian river on which Melbourne, Victoria, is situated; length about 100 miles. On account of falls it is not navigable above Melbourne. See MELBOURNE.

YATES, EDMUND HODGSON, an English journalist and novelist; born in Edinburgh, Scotland, July 3, 1831; the son of the actor Frederick Henry Yates (1797-1842), who from 1825 was manager of the Adelphi Theater. He was educated at Highgate and Düsseldorf, and from 1847 till 1872 had a position in the postoffice, being for 10 years chief of the missing letter department. He lectured in the United States in 1872-1873; was special correspondent at

Vienna, St. Petersburg, etc., of the New York "Herald" in 1873-1875; and London correspondent of the New York "Tribune" for a number of years. He wrote the following novels: "For Better, for Worse" (1863); "Broken to Harness" (1864); "Running the Gauntlet" (1865); "Kissing the Rod" (1886); "The Black Sheep" (1867); "Wrecked in Port" (1869); "Castaway" (1872); "A Waiting, etc., Race" (1872); and "Recollections and Experiences" (1885). He was editor of "Temple Bar," "Tinsley's" and other periodicals, and in 1874 founded, with Grenville Murray, a very successful "society" weekly, "The World," which, for a libel on Lord Lonsdale, involved him in 1884 to two months' imprisonment. He died May 20, 1894.

YATES, RICHARD, an American lawyer; born in Warsaw, Ky., Jan. 18, 1818; was graduated at Illinois College, Jacksonville, in 1838; practiced law a number of years; was elected to the legislature in 1842; and sent to Congress in 1850. In 1860 he was elected governor of Illinois. He was strongly opposed to slavery, and an ardent supporter of the government during the Civil War, taking an active part in the organization of volunteer regiments. He was United States Senator in 1865-1871, and afterward United States railroad commissioner. He died in St. Louis, Mo., Nov. 27, 1873.

YAZOO CITY, a city and county-seat of Yazoo co., Miss.; on the Yazoo river and on the Yazoo and Mississippi Valley railroad; 45 miles N. W. of Jackson. It is in an extensive corn and cotton-growing section. Here are waterworks, a sewer system, electric lights, National and other banks, and a number of weekly newspapers. It has large lumber interests, a large cotton seed oil plant, etc. Pop. (1910) 6,796; (1920) 5,244.

YAZOO RIVER (from an Indian word meaning "river of death"), a tributary of the Mississippi. It lies throughout its whole extent in the State of Mississippi. The Yazoo proper, formed by the confluence of the Tallahatchie and the Yalobusha, originates near Greenwood, and after a deep, slow, tortuous S. W. course of 290 miles enters the Mississippi 12 miles above Vicksburg. It traverses a fertile country, and is throughout navigable. The waters of the Tallahatchie are partly received from the Mississippi itself, and, but for a slight obstruction, steamers from the Mississippi might thus enter the Yazoo at its extreme source, and after traversing its whole length re-enter the Mississippi at Vicksburg.

YEAR, a unit of time, marked by the revolution of the earth in its orbit. The year is either astronomical or civil. The former is determined by astronomical observation, and is of different lengths, according to the point of the heavens to which the revolution is referred. When the earth's motion is referred to a fixed point in the heavens, as a fixed star, the time of revolution is the time which elapses from the moment when the star, the sun, and the earth are in a straight line, till they again occupy the same position; this is called a sidereal year. If the revolution is referred to one of the equinoctial points, the year is somewhat shorter than the sidereal year, on account of the precession of the equinoxes, that is, the retrogression of the equinoctial points along the ecliptic. This is called the equinoctial, tropical, or solar year. The length of the sidereal year is 365.2563612 mean solar days, or 365 days, 6 hours, 9 minutes, 9.6 seconds. The length of the solar or equinoctial year is 365.2422414 mean solar days, or 365 days, 5 hours, 48 minutes, 49.7 seconds. The difference between these two years is 19 minutes 19.2 seconds mean solar time, that being the time required for the earth to advance in its orbit a distance of 50.1″ of arc. The civil year is the year of the calendar. It contains a whole number of days, beginning always at midnight of some day. According to the present system, or according to the Gregorian calendar, every year the number of which is not divisible by 4, also every year which is divisible by 100, and not by 400, is a common year, and contains 365 days. All other years are called leap years, and contain 366. The ecclesiastical year is from Advent to Advent. A lunar year is a period consisting of 12 lunar months. The astronomical lunar year consists of 12 lunar synodical months, or 354 days, 8 hours, 48 minutes, 36 seconds. The common lunar year consists of 12 lunar months or 354 days. The Embolismic or Intercalary lunar year, consists of 13 lunar civil months, and contains 384 days. Also the period in which any planet completes a revolution; as, the year of Jupiter or of Saturn.

Year and a day, in law, the lapse of a year and one day added to it; a period which determines a right or works prescription in many cases. Year day and waste, in law, part of the sovereign's prerogative in England, whereby he was entitled to the profits for a year and a day of the tenements of persons attainted by petty treason or felony, together with the right of wasting the said tenements; afterward restoring it to the

lord of the fee. It was abolished by the Felony Act, 1870. Year of grace, any year of the Christian era. Year to year tenancy, in law, a tenancy taken at first for a year, but which continues for a second year unless one of the parties on the expiration of the first six months intimates to the other his intention not to renew it. The same rule will obtain year after year till the six months notice of non-renewal is given.

YEAST, the yellow substance, having an acid reaction, produced during the vinous fermentation of saccharine fluids, rising to the surface, when the temperature of the fluid is high, in the form of a frothy, flocculent, viscid matter (surface yeast), and falling to the bottom (sediment yeast) when the temperature is low.

YEATS, WILLIAM BUTLER, an Irish poet; born in Dublin, Ireland, June 13, 1865. He wrote: "The Wanderings of Oisin" (1889); "John Sherman" (1893); "The Countess Kathleen" (1892); "A Book of Irish Verse" (1895); "The Secret Rose" (1897); "The Wind Among the Reeds" (1899); "Reveries from Childhood and Youth" (1916).

YELL, the second largest of the Shetland Islands; separated from the mainland by Yell Sound; 25 miles N. of Lerwick. It is about 17½ miles in length, and from half a mile to 6 miles in breadth. The surface is chiefly moorland, and fishing is the leading employment.

YELLOW FEVER, an infectious continued fever, ushered in with languor, chilliness, and more or less severe lumbar pains and frontal headache, countenance flushed, eyes at first humid, then suffused, and ultimately ferretty, skin imparting a tingling heat to the touch, and, as the second stage advances, gradually acquiring a lemon or greenish-yellow tinge, mind usually disturbed with hallucinations, or more or less violent delirium, restless watchfulness, or, possibly, drowsiness even to extreme coma, epigastric uneasiness, spontaneous vomiting without effort, first of a clear glairy fluid, but subsequently with coffee-ground flocculi, or blood itself, often, toward the close, with irrepressible hiccough, and wild shrieking or melancholy wailing, tendency fatal, but the disease generally confers an immunity from subsequent attacks.

The first recorded outbreak of yellow fever occurred in the West Indies in 1647, and since that time it has been recurring at regular intervals in an epidemic form, and gradually extending its range; but it is endemic in certain localities, and notably so in the islands of St. Thomas and Santo Domingo. Regarding its altitudinal and horizontal ranges Dr. Macdonald says: "It may be very well to assign an altitudinal limit of the spread of yellow fever, and, roughly speaking, this may be estimated at between 2,000 and 3,000 feet above the level of the sea, but the local conditions of every country seem to determine a range peculiar to itself. Thus the disease has been known at Newcastle, Jamaica, at an elevation of 4,000 feet, while in the valley of the Mississippi its highest recorded range is about 600 feet (admitting the fever of Gallipolis to be of the genuine type). Humboldt alludes to the farm of Encero, in Mexico, at an elevation of 3,243 feet, as the altitudinal limit of the black vomit. At Santo Domingo the encampments of the French in 1792 and of the English in 1796 enjoyed an immunity from the disease, while it was spread far and wide among the troops in the low country. Though the West Indian Islands, and the neighboring coasts of North and South America, may be looked on as the focal area of yellow fever, yet, taking the outlying points at which its occurrence in the epidemic form has been recorded, its geographical range must be regarded as very considerable indeed, *i. e.*, between lon. 97° W. and 2° E., and between lat. 48° N. and 35° S. At least for the space of a century and a half, up to the year 1850, the Amazon river, dividing the Brazils from Guiana, limited the extension of yellow fever S. of the line; and while the disease was raging at Rio and Bahia, at the close of that epoch, the Montevideans flattered themselves that they were without the geographical limits of the pestilence, till it fell to their turn to sustain its visitation several years later, when the illusion was dispelled. Similar facts may be adduced regarding the extension of the disease along the shores of the Pacific; so that, however well we may be acquainted with its present range, making all due allowance for temperature, we cannot tell what the future may bring forth. In this connection it may be mentioned that a temperature of at least 72° is assumed to be essential to the development of yellow fever, though cases exceptional to this rule may now and then happen. Yellow fever is communicated from one person to another only by a species of house mosquito (*Stegomyia fasciata*). As a result of this knowledge it was entirely eliminated from the Panama Canal zone, and from other tropical areas, including Havana.

In December, 1878, a board of experts,

consisting of twelve medical men and a sanitary engineer, with Surgeon-General Woodworth as president, was appointed by the Health Committees of the Senate and House of Representatives of the Congress of the United States to investigate the yellow fever epidemic, and they came to the following conclusions: (1) Yellow fever is a specific disease, due to a specific poison which has not been chemically or microscopically demonstrated, nor in any way made evident to the human senses; it is material and particulate, and endowed with the vital properties of growth and reproduction; the disease is not malarial, and malarial influences do not contribute toward its dissemination or mortality to any greater extent than to other epidemic diseases; a concurrence of local conditions seems to be necessary to the evolution of the disease, but what these are we have no positive knowledge. (2) Yellow fever is a disease of singular local attachments, often prevailing in a very small section of a city, with remarkable indifference to topographical and social surroundings; while atmospheric air is the usual medium by which it is conveyed, it has been in no instance established that the disease has been carried to any considerable distance by atmospheric currents, or by any modes or vehicles of conveyance other than those connected with human traffic and travel; the period of incubation varies from two to five days; the fever is unknown in Asia; the white race is most susceptible to its influence, and furnishes the highest ratio of deaths.

YELLOW SEA (Chinese, Whang Hai), an arm of the Pacific Ocean; on the N. E. coast of China; length about 620 miles; greatest breadth, about 400 miles. It is very shallow, and obtains its name from the lemon-yellow color of its water near the land, caused by mud suspended in the water from the inflow of the Hoang-ho and Yangtse-kiang rivers.

YELLOWSTONE, a river of the United States, which rises in the Rocky Mountains, about lat. 44° N. and lon. 110° W. After a course of about 25 miles it passes through the lake of the same name, and runs N. through the Yellowstone National Park. Soon after issuing from the lake the river makes at intervals a series of falls (the last being 300 feet high), and traverses cañons, one of which, the Great Cañon, is 30 miles in length, its steep sides being colored in bright hues and shaped in great variety of fantastic forms. Running in a N. E. direction the river ultimately joins the Missouri about lat. 48° N., after a course of about 1,100 miles. Steamers can ascend it for 300 miles to the mouth of the Big Horn, which is its largest affluent.

YELLOWSTONE LAKE, formerly called SUBLETTE'S LAKE, a beautiful lake in Wyoming, at the N. E. base of the Rocky Mountains; in the National Park of the Yellowstone, at an elevation of 7,788 feet above sea-level. Its greatest extent is about 20 miles, and its greatest depth 300 feet. Its outlet is the Yellowstone river, which issues from the N. end of the lake. The Upper Yellowstone river enters at the opposite side. This lake is surrounded on several sides by high mountains, among which are Mount Sheridan and Mount Langford.

YELLOWSTONE NATIONAL PARK, a remarkable region in the extreme N. W. corner of Wyoming; set apart by Congress for a National reservation in 1872. Its area was originally 3,575 square miles, to which Congress, in 1891, added a tract of nearly 2,000 square miles to the S. and E.—nearly all more than 6,000 feet above sea-level, and rising in the snow-covered mountains to 10,000 to 14,000 feet. Situated on the "Great Divide," its pine-clad mountains form the gathering ground for the headwaters of large rivers flowing away to the Atlantic and Pacific Oceans, and for the sake of the rainfall and the rivers its forests are carefully preserved.

The mammoth hot springs are of a class with those in the geyser basin. The element of beauty enters into the formations from the deposits left by the water. These have been built up by ages of activity, and are in scalloped terraces. Their greatest activity is manifested at the base of Capitol Hill, on the picturesque bank of the Gardiner river. But there are unmistakable evidences of their activity for miles back, for cedar-crowned mounds yet yield treasures to the tourist who seeks specimens with a well-directed spade. In walking over some of the terraces where the water has ceased to run, the formation sounds hollow underneath, the action of the elements having built the terraces at the expense of the limestone beds below the surface. Caverns have been found underneath the now inactive basins, which are resplendent with stalactite and stalagmite formations that glisten under the blaze of a torch with singular brilliancy.

YEMEN ("the land to the right of Mecca"), a district in the S. W. of Arabia, bounded on the N. by Hedjas and on the E. by Hadramaut, and measuring about 400 miles in length by about 150

miles in breadth. At about 30 miles from the coast a range of wooded mountains (rising occasionally to 6,000 and 8,000 feet) stretches along the whole length of the country. Between this range and the sea stretches the scorchingly hot plain called Tehameh. Further inland the country becomes an elevated plateau. Though destitute of rivers, the whole region is very fertile, and coffee, tobacco, dates, gums, and spices are produced and exported in abundance. There are valuable pearl fisheries on the coast. The inhabitants are Arabs, but possess many distinctive characteristics, and are supposed to be descended from the ancient Sabæans. The government rests with the different sheiks or tribal chiefs, among whom the Imaun of Sana holds supreme authority. The principal towns are Sana, the capital, Mocha, and Hodeda Mareb. Aden is not now within the limits of Yemen. The Arabia Felix of the ancients, Yemen was conquered by the Abyssinians (A. D. 525) and Persians (597). In the year 628 it submitted to Mohammed, since the 16th century has been subject to Turkey, and after the extension of Turkish rule (1871-1873) was formed into a vilayet.

YENIKALE (yen-ē-kä'lā) **STRAIT OF**, a body of water connecting the Black Sea with the Sea of Azof; is about 20 miles long, and in some parts only 2 miles broad and 2 fathoms deep.

YENISEI, the longest river of Siberia, rises as the Kem to the W. of the Kosso-Kol, S. of the Gurbi Mountains, flows W. as the Ulan ("Great") Kem between the Sayan and Tangnu Mountains, then suddenly breaks N. through the Sayan Mountains, and after a course of 3,300 miles falls into the Arctic Ocean. Its breadth varies from 3,400 feet to 14 miles, and during the last 140 miles it is so wide as to form an arm of the sea. Its depth varies from 11 to 90 feet. The waters of the Yenisei are clear and rich in fish. They are navigated by paddle steamers, drawing barges, and by a number of five or six cornered flat-bottomed boxes which convey flour down stream, and are broken up at their destinations. The Yenisei receives from the right the Upper Tunguska or Angara (the outlet of Lake Baikal), the Irkut, Middle Tunguska, and Lower Tunguska. Nordenskjöld's voyage in the summer of 1875 from Tromsö to the mouth of the Yenisei opened up a trade by sea with northern Siberia, in which a number of vessels are now engaged, finding six weeks in summer when the passage to and from the Yenisei can be made with little difficulty.

YENISEISK, a province of eastern Siberia, Russia; bounded E. by Yakutsk and Irkutsk, S. by Mongolia, W. by Tomsk and Tobolsk, and N. by the Arctic Ocean; area, 987,186 square miles; pop. (1908) 689,700. The S. part is occupied with the Altai Hills and their offsets. In the Yenisei valley considerable tracts are under tillage, but N. of the town of Yeniseisk this is succeeded first by pasturage, then by stretches ever more and more desolate, to the frozen tundras. The chief river is the Yenisei. Smaller streams are the Taimyr, Katanga, and Anabar, which like the Yenisei, form great gulfs at their mouths. The gold washings of Yeniseisk occupy 12,000 to 15,000 men and several thousand horses. Of the native tribes, who live by hunting, fishing, and trade in fur, the most are Samoyedes and Tungus. The capital is Krasnoiarsk.

YEOMAN, a term which seems, in early English history, to have been applied to a common attendant menial servant, but after the 15th century came to denote a class of small freeholders, forming the next grade below gentlemen. The term yeoman was also given to the 40-shillings freeholder, or, more loosely, to any small farmer or countryman above the grade of laborer. The term is also familiar in the titles of functionaries in royal households, such as yeoman usher of the black rod, yeoman of the robes, etc.

YEOMANRY, specifically, a force of volunteer cavalry first embodied in Great Britain during the wars of the French Revolution, and consisting to a great extent of country gentlemen and farmers. They are liable to be called out in aid of the civil power in case of riot at any time; in case of actual invasion, or the appearance of an enemy on the coast or during a rebellion, they may be assembled for actual service; they are then subject to the Mutiny Act and Articles of War, and may be called upon to serve in any part of Great Britain.

YERBA MATÉ. See MATÉ.

YERKES, CHARLES TYSON, an American capitalist; born in Philadelphia, Pa., June 25, 1837; was engaged as exchange broker in 1858-1861, and as banker in 1861-1886. He failed in 1871, and for misappropriation of public funds was convicted and imprisoned, but was afterward pardoned. He recovered his fortune in a few years; was prominent in street railway operations in Philadelphia, and after 1886 in Chicago, where he was at the head of several railway corporations. In 1902 he was engaged

in constructing a system of underground railroads in London, England. In 1892 he gave an observatory to the University of Chicago. He died in New York City, Dec. 29, 1905.

YERKES OBSERVATORY, the observatory of Chicago University, at William's Bay, Wis., near the shore of Lake Geneva, 75 miles N. of Chicago, founded in 1892 by Charles T. Yerkes, of Chicago, and completed in 1895. The site, chosen with a view to escaping the smoke, dust, electric lights, and noise of a city, consists of 50 acres of wooded land.

YEZO, or **EZO**, less correctly **YESSO**, native **HOKKAIDO**, the most N. of the four great islands of Japan; still only partially settled; area, 36,299 square miles; pop. about 700,000. Its official name is Hokkaido, or "Circuit of the Northern Sea," received in 1870, when it was brought under a special colonization department. An agricultural mission from the United States assisted in founding model farms, laying out roads, and building bridges. The capital was changed from Matsumae to Sapporo, which was provided with a railroad to Otam, its port, and to Poronai, the great coal district inland. An agricultural college, breweries, canning factories, beetroot sugar factories, etc., were established, but with inconsiderable results. The coal mines are worked by convict labor. A system of military settlements has of late years been put into force, partly with the view of furnishing a militia against possible invasion from Russia, which is supposed to covet the fine harbors of Yezo. The exposed port of Otam will probably be abandoned for the more sheltered harbor of Mororan, on Volcano Bay, now a naval harbor, to which a railway from Poronai mines has been built. The principal products of Yezo are coal, seaweed, sulphur, fish, the catches of salmon on the river Ishikari being sometimes enormous. At the restoration in 1868 the supporters of the Tokugawa government made a last stand here, and were finally defeated at Hakodate. Yezo has a rigorous climate, being for six months in the year under snow and ice (two feet in the S. to eight feet in the N.). The center of the island is but little known, though it has been crossed twice or thrice by Japanese and European explorers; the Ainos live mostly near the mouths of the rivers. The interior is mountainous and inhospitable; there are several active volcanoes.

YGDRASIL, or YGGDRASILL (ig'dra-sil), in Scandinavian mythology, the giant ash tree spread over the whole world reaching above the heavens, symbolizing the universe, the branches of which reach down to the under world, or Scandinavian hell.

YOAKUM, a city of Texas, in De Witt and Lavaca cos. It is on the San Antonio and Arkansas Pass railroad. Its industries include railroad shops, a canning factory, an ice factory, flour mills, bottling works, etc. Pop. (1910) 4,657; (1920) 6,184.

YOGA, one of the six Darsanas, *i. e.*, schools or systems of Brahmanical philosophy, that of Patanjali, the essence of which is meditation. It believes in a primordial soul which has had existence from an earlier period than primeval matter, and holds that from the two arose the spirit of life (Mahanatma). Theoretically, at least, its devotees can acquire even in this world entire command over elementary matter by certain ascetic practices, such as long continued suppression of the respiration, inhaling and exhaling the breath in a particular manner, sitting in 84 attitudes, fixing the eyes on the tip of the nose, and endeavoring, by the force of mental abstraction, to unite themselves with the vital spirit which pervades all nature and is identical with Siva. When this mystic union is effected, the Yoga can make himself lighter than the lightest, or heavier than the heaviest substance, or as small or as large as he pleases; he can traverse all space, can become invisible, can equally know the past, the present, and the future, and can animate any dead body by transferring to it his own spirit; finally he becomes united with Siva, and is excempt from the necessity of undergoing further transmigrations.

YOKOHAMA, the chief port of entry in Japan, and the headquarters of foreign shipping companies, banks, consulates, and commerce generally. Till the opening of the country in 1854 it was an insignificant fishing village, contiguous to the important town of Kanagawa, originally granted as a treaty settlement. The obstructions offered by the Japanese and the impatience of foreign merchants led to the practical abandonment of Kanagawa, which, however, still remained nominally the seat of the various consulates. Yokohama is a well laid-out town, but contains narrow winding streets. The Bluff, conceded for residence in 1867, is a beautiful spot which commands fine views of Fuji-san and of Yokohama bay. Other parts of the town have also been greatly improved and there are now many fine buildings, hospitals, churches, clubs, parks, etc.

The bay is very beautifu., and, though only an open roadstead, affords a good and commodious anchorage. Work on a large harbor was carried out in 1889-1896, the main object of which was to prevent the gradual silting up of the anchorage; it is inclosed by two breakwaters 1¼ miles long, and an iron pier, 1,900 feet long, connected with the railway to the capital, 17 miles off. Yokohama is a center for tourists visiting Japan. The foreign community here is the largest in the country; after the Chinese, British residents, chiefly merchants and brokers, bulk most largely. There is an imperial health laboratory here, admirably conducted. The entire foreign trade of Yokohama in 1918 was about $665,163,000, the exports having a value of nearly double the imports. Silk represents three-fifths of the exports, the rest being other tissues, tea, rice, copper, curios, etc.; the imports are cotton and woolens, raw sugar, oils, metals, chemicals, arms, and ammunition, watches, etc. Pop. about 450,000.

YONGE, CHARLOTTE MARY, an English novelist; born in Otterbourne, Hampshire, England, Aug. 11, 1823. She published more than 30 novels, usually of "High Church" tendencies, the most popular of which are: "The Heir of Redclyffe" (1853); and "Daisy Chain; or, Aspirations" (1856). The profits of the former were largely given by her to fitting out the missionary schooner "Southern Cross" for Bishop Selwyn, of New Zealand; those of the latter ($10,000) to the erection of a missionary college at Auckland, New Zealand. Among her historical and biographical works are: "The Kings of England" (1848); "Landmarks of History, Ancient, Middle Age, and Modern" (1852-1857); "The Victorian Half Century" (1887); etc. She died in Winchester, March 24, 1901.

YONKERS (yungk'urs), a city in Westchester co., N. Y.; on the Hudson river and on the New York Central and Hudson River railroads; immediately adjoining New York City on the N. It is noted for its beautiful suburban residences, many of which are built on the terraces of the Hudson, the shore of which here reaches an altitude of 425 feet above the tide water, thus giving grand views of the river and the opposite shore. Here are Lowden and Halsted Schools, a high school, public library, Hebrew Home for the Aged and Infirm, the Leake and Watts Orphan Home, Homœopathic Home, St. Joseph's Hospital, St. John's Riverside Hospital, and "Graylock," the summer residence of the late Samuel J. Tilden. In the suburbs are the Convent of Mount St. Vincent and the former residence of Edwin Forrest, now used as the art gallery of the convent. The public school enrollment is over 10,000. The city has manufactories of carpets, hats, elevators, sugar, maltine, tools, chemicals, silk goods, etc. Pop. (1910) 79,803; (1920) 100,176.

YONNE (yon), a department of France; surrounded by the departments of Seine-et-Marne, Aube, Côte-d'Or, Nièvre, and Loiret; area, 2,868 square miles; pop. about 300,000. The department is watered by the Yonne river, which flows across it in a N. E. direction. The surface is hilly, many of the hills being covered with fruitful vineyards, the intervening valleys being beautiful and fertile. There are some fine forests in the department. The vineyards yield large quantities of wine, the best being those of Chablis, Auxerre, and Tonnere. The chief mineral products are red granite, marble, limestone, and ocher; and there are some miscellaneous manufactures. Capital, Auxerre.

YORK, a city and county-seat of York co., Pa.; on Codorus creek, and on the Pennsylvania, the Western Maryland and the Maryland and Pennsylvania railroads; 28 miles S. S. E. of Harrisburg. Here are a Young Ladies' Seminary, Collegiate Institute, County Academy, business colleges, court house, numerous churches, several libraries, hospital and dispensary, street railroads, electric lights, a number of public parks, several National and other banks, and daily, weekly, and monthly periodicals. It has foundries, car shops, manufactories of agricultural implements, shoes, condensed milk, wall paper, iron and steel, organs and pianos, cigars, soap, hosiery, wire cloth, carriages, and wagons, etc. From Sept. 30, 1777, until June 27, 1778, the Continental Congress met here while Philadelphia was occupied by the British army. Pop. (1910) 44,750; (1920) 47,512.

YORK (Latin, Eboracum), a cathedral city and archbishop's see, a municipal and parliamentary borough, and capital of Yorkshire, England, 188 miles N. of London, at the confluence of the Foss and the Ouse. The city proper, embracing a circuit of nearly 3 miles, was inclosed by walls, restored by Edward I., the portions of which still remaining have been converted into promenades, commanding a prospect of the surrounding country. There are many quaint old-fashioned houses in the narrow streets of its older portion. The great object of attraction, however, is the

minster or cathedral, the finest in England, which dates from the 7th century, but did not begin to assume its present form till the 12th century, and was not complete till 1472. It is built in the form of a Latin cross with choir, aisles, transepts, a central tower and two W. towers; extreme length, 524 feet; extreme breadth, 250; height of central tower, 213 feet. York was the capital of Roman Britain. It was made an archiepiscopal see by Edwin of Northumbria in 624. It still ranks second among English cities, its archbishop having the title of Primate of England, and its chief magistrate takes the title of lord-mayor. It was incorporated by Henry I., and the city boundaries were extended in 1884. The trade is local and the industries unimportant. Pop. about 80,000.

YORK, a river of Virginia; formed by the union of the Pamunkey and Mattapony, flowing S. E. to Chesapeake bay, nearly opposite Cape Charles; 40 miles long by from 1 to 3 miles wide.

YORK, HOUSE OF, an English royal family, rival to that of Lancaster, and possessor of an elder right to the crown. The first duke of York was EDMUND PLANTAGENET, called also de Langley, fifth son of Edward III. His second son, Richard, Earl of Cambridge, married Anne Mortimer, daughter of Roger, Earl of March, and granddaughter of Lionel, Duke of Clarence, the third son of Edward III. On the line of this king's eldest son becoming extinct in 1399, by the death of Richard II., the issue of Anne Mortimer inherited the true representation of Edward III. The rival house of Lancaster was descended from JOHN OF GAUNT, Duke of Lancaster, and fourth son of Edward III. The house of York furnished three kings to the throne of England: Edward IV., Edward V., and Richard III. The house of Tudor, which supplanted it, was allied to it by the marriage of Henry Tudor, afterward Henry VII., with Elizabeth, eldest daughter of Edward IV. In the struggle between the houses of York and Lancaster, the partisans of the former were distinguished by a white and those of the latter by a red rose. Hence the title "War of the Roses."

YORK PENINSULA, in Queensland, Australia, the region lying on the E. side of the Gulf of Carpentaria, and terminating at its N. end in Cape York.

YORKTOWN, a town and county-seat of York co., Va., on the York river; 7 miles W. of Chesapeake bay. Here is the oldest custom house in the United States. The city has several public schools, and a monument commemorating the surrender of the British army under Lord Cornwallis. It is historically famous for its two sieges in 1781 and 1862. In the first the British, numbering 8,000, made a stand and threw up earthworks, in August, 1781, and were supported by several vessels in the York river. Washington with an army of 16,000, including 7,000 Frenchmen, and aided by a French fleet, under Count de Grasse, forced the surrender of the place, Oct. 16, 1781. The total loss of the allied troops was about 300, and that of the British about 550. This was the last important action in the Revolutionary War. In the spring of 1862 the city was occupied by 50,000 Confederates under Generals Johnston and Magruder. On April 5, General McClellan laid siege to it with 90,000 men. The Confederates withdrew from the city on May 3, and were pursued till the 5th, when the battle of Williamsburg was fought, resulting in a victory for the Union army. Pop. about 150.

YORUBA (yō'-), a country of west Africa, N. of the Bight of Benin. It is peopled by a number of confederated tribes, and is now attached to the colony and protectorate of Lagos. Much of the country is fertile and well cultivated, and the inhabitants have made great progress in the industrial arts. They are chiefly pagans, but Mohammedanism has made way among them. Protestant and Roman Catholic missions have long been at work among them. Ibadan is the largest town.

YOSEMITE VALLEY, a cleft in the W. slope of the Sierra Nevada, about the center of California, and 140 miles E. of San Francisco. The name Yosemite is an Indian word which signifies "large grizzly bear." This celebrated valley, noted for the sublimity and beauty of its scenery, is about 7 miles long and from ½ to nearly 2 miles in breadth, and is traversed by the Merced river.

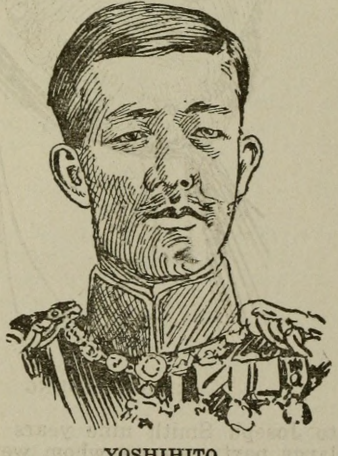
John Conness, United States Senator from California, induced Congress in 1864 to pass a bill setting apart the Yosemite Valley and the compassing heights as a public park or pleasure ground. At that time Yosemite was scarcely as much as a name to the world at large, but some Californians had discovered that the place had immense prospective value as "the greatest show on earth," and very naturally they had set about obtaining possession of such "show" by settling in the valley with the expectation of acquiring title under the pre-emption law. Through the act above

mentioned those settlers were dispossessed, compensation being given for such "improvements" as had been made.

In 1866, at the first session of the California Legislature after the passage of the above act by Congress, the grant was accepted by this State. The grant covers an area of 38,111 acres—mostly rock. While this tract is quite unique in the variety and excellence of its beauties, it is, after all, only one detail in a much more extensive region, abounding at all points with sights but little less imposing than those of Yosemite. If the latter were blotted out of existence, the region would still remain a marvel in the domain of mountain scenery. It is a land of gigantic shapes in granite—the most marked peculiarity being, as in the Yosemite, the great height and the verticality of the rock walls, and the frequency of the dome-like formations with which the walls are topped.

It is also a land of lakes of the most captivating picturesqueness, a land of fishing streams, and of many waterfalls, of stretches of meadow made beautiful by nature to temper the mountains' harshness, and of belts of regal timber draping the rocky slopes. It is, too, a land of snow, where at the greater elevation the snow never entirely disappears, and where at lesser altitudes the earth is white during between six and eight months of each year. This feature is by no means the least valuable part of the region's character.

YOSHIHITO, Emperor of Japan, born in 1879, the third son of the Emperor



YOSHIHITO

Meiji Tenno. He became Crown Prince in 1890, following the death of the second of his elder brothers. For a period of eight years he was a student at the Gakushu-in or Peers' School, after which his studies were continued at the palace in Aayama, Tokyo. When he arrived at the appointed age in July, 1897, he took his seat in the House of Peers. On May 10, 1900, he married Princess Sada-Ko, the fourth daughter of Prince Kujo. By her he has had three children, Prince Hirohito, the Crown Prince (born 1901), Prince Yashuhito (born 1902), and Prince Nabuhito (born 1905). After his marriage he toured the provinces of the Japanese Empire, making himself acquainted with the whole country. On Aug. 20, 1912, following the death of his father, he ascended the throne. Since his accession Yoshihito, who according to custom is known to the upper strata of Japanese society as Shu-jo or "Supreme Master," and to the mass of the people as Tewshi Sama or "August Son of Heaven," has shown democratic tendencies and is popular. He has shown an eager desire to co-operate with his ministers in the furtherance of Japanese ambitions for the strengthening of the empire.

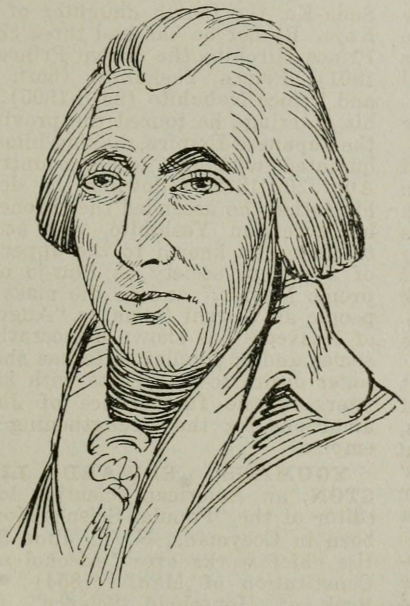
YOUMANS, EDWARD LIVINGSTON, an American scientist, long the editor of the "Popular Science Monthly"; born in Coeymans, N. Y., June 3, 1821. His chief works are: "Alcohol and the Constitution of Man" (1854); "Hand-Book of Household Science" (1857); "Correlation and Conservation of Forces" (1864); "The Culture Demanded by Modern Life" (1867); etc. He died in New York City, Jan. 18, 1887.

YOUMANS, WILLIAM JAY, an American chemist; born in Milton, Saratoga co., N. Y., Oct. 14, 1838. He published a book, "Pioneers of Science in America" (1895); edited Huxley's "Lessons in Elementary Physiology," adding a second part, "Elementary Hygiene" (1867); and was for a number of years editor of the "Popular Science Monthly," succeeding his brother Edward. He died in Mount Vernon, N. Y., April 10, 1901.

YOUNG, ANDREW WHITE, an American political economist; born in Carlisle, N. Y., March 2, 1802. He wrote "Introduction to Science of Government" (1843); "Citizen's Manual of Government and Law" (1851); "The American Statesman: A Political History of the United States" (1855); "National Economy: A History of the American Protective System" (1860). He died in Warsaw, N. Y., Feb. 17, 1877.

YOUNG, ARTHUR, an English political economist; born in Suffolk, England, Sept. 11, 1741. He became a farmer, and made a series of agricultural tours

in England, Ireland, and France, publishing accounts of them, which were very favorably received, and in 1793 he was appointed secretary to the newly constituted Board of Agriculture. Of his many writings his "Travels in France,"



ARTHUR YOUNG

published in 1792, is the most interesting, from its sketches of the social as well as the agricultural conditions of the French provinces just before and just after the revolution of 1789. He died in London, April 20, 1820.

YOUNG, BRIGHAM, an American Mormon; born in Whitingham, Vt., June 1, 1801. His father was a farmer, and he himself learned the trade of painter and glazier. Early in life he joined the Baptists, but when about the age of 30 was converted to Mormonism, and openly joined the sect at Kirtland, O., in 1832. In 1835 he was ordained an elder and sent forth among the 12 apostles, the New England States being the district assigned to him. Here he is said to have been very successful in his proselytizing labors. On the death of Joseph Smith, in 1844, he was unanimously chosen president and prophet, though he had three competitors for the office, one of whom, Sidney Rigdon, he soon afterward excommunicated. On the forcible expulsion of the sect from Nauvoo, Ill., President Young led them through toils and dangers, which nothing but the most admirable energy could have conquered, over the plains and table-lands to the splendid valley in the heart of the Rocky Mountains, where, between the Wasatches and the Great Salt Lake, he founded (July, 1847) the present Salt Lake City. His immediate followers forming a nucleus, others poured into "the Promised Land," and in 1849 an attempt was made to organize a State, to be called the State of Deseret, that being the official name given by the Mormons to the district. The United States Government refused to sanction the new State, but Utah was organized as a territory, and Young appointed governor. The appointment of a "Gentile" governor in 1854 led to serious troubles, as Young and the other Mormons refused to recognize his authority, and it was not till a force of 2,500 troops was sent out in 1857 that the United States Government could enforce its laws on the turbulent sectaries.

Young was the founder of polygamy as an institution, and was among the first to practice it. In 1852 he promulgated the "celestial law of marriage," which he declared to have been revealed



BRIGHAM YOUNG

to Joseph Smith nine years before. A large party, among whom were Smith's wife and sons, in the Church opposed the innovation, and declared the revelation to be a forgery, but Young's influence carried the day. He himself had

from 15 to 18 actual wives, besides numerous spiritual wives who were formally "sealed" to him. He was twice indicted for polygamy, but each time the case fell through. His 15th wife sued for a divorce in 1875. The barbarous Mountain Meadow Massacre of 1858 was brought to the notice of the law in 1875. In it a train of 136 emigrants, who had come into collision with the Mormon settlers, was practically exterminated, only a few children being allowed to escape. The court exonerated Young from complicity in the affair, though the suspicion was never satisfactorily cleared away, but "Bishop" Lee, a leading Mormon, was condemned to death in 1876, and shot in March, 1877, on the scene of the massacre. Brigham Young was a man of undoubted ability, strength of character, and shrewdness. He died in Salt Lake City, Aug. 29, 1877. See MORMONS.

YOUNG, CHARLES AUGUSTUS, an American astronomer; born in Hanover, N. H., Dec. 15, 1834; was graduated at Dartmouth College (1853), Professor of Mathematics, Physics, and Astronomy in Western Reserve College (1857-1866); captain of a company of the 85th Ohio Volunteers (1862); Professor of Astronomy and Physics in Dartmouth College (1866-1877); Professor of Astronomy in the College of New Jersey at Princeton (1877). He was a member of the eclipse parties to Iowa in 1869, and to Spain in 1870; of the transit of Venus party to Pekin, China, 1874, and organized the Princeton eclipse expedition to Denver in 1878. He discovered the green line of the solar corona in 1869, and identified it with the line 1,474 of Kirchoff's scale. At the 1870 eclipse he discovered the so-called "reversing layer" surrounding the solar photosphere, and in 1872 at Sherman, Wyo., detected the bright reversal of many lines of the solar spectrum in ordinary sunlight. At Dartmouth College he made the first determination of the sun's rotation from the displacement of the lines of its spectrum at the E. and W. limbs, and he was recognized as one of the leading authorities in spectroscopy and in all matters relating to the sun. He was a lecturer in the courses of the Peabody Institute at Baltimore, the Lowell Institute at Boston, and at many colleges. He wrote: "The Sun" (1882), and "General Astronomy" (1889), the best works on their respective subjects in any language; also "Elements of Astronomy" (1890); "Lessons in Astronomy" (1891); "Uranography." He was vice-president and president of the American Association for the Advancement of Science, an associate of the American Academy of Arts and Sciences, of the Royal Astronomical Society of Great Britain, and a member of the National Academy of Sciences. He died Jan. 4, 1908.

YOUNG, JAMES, a British chemist; born in Glasgow, Scotland, in 1811; studied chemistry under Professor Graham at Anderson's College, Glasgow, and became assistant both there and at University College, London. Receiving appointments in chemical works at St. Helen's and Manchester, he discovered a method of distilling oil from shale, through which he became the founder of the mineral oil industry of Scotland, besides leading to the development of the petroleum industry in America and elsewhere. He acquired a large fortune and endowed a chair of technical chemistry in Anderson's College, Glasgow. He died in 1883.

YOUNG, JESSE BOWMAN, an American clergyman, author, and editor; born in Berwick, Pa., July 5, 1844; was graduated at Dickinson College in 1868; served three years in the Union army in the Civil War, ending as captain in the 84th Pennsylvania Volunteers; entered the ministry of the Methodist Episcopal Church in 1868, and was pastor in Pennsylvania and Kansas City, Mo.; editor of the "Central Christian Advocate" (1892-1900); etc. He wrote: "What a Boy Saw in the Army"; "Days and Nights on the Sea"; "Helps for the Quiet Hour" (1900). He died in 1914.

YOUNG, SIR JOHN, BARON LISGAR, a British statesman; born in Bombay, British India, Aug. 31, 1807; was graduated at Oxford University in 1829 and called to the bar in 1834. He was a member of the House of Commons in 1831-1845; lord of the treasury in 1841-1844; secretary of the treasury in 1844-1846; chief secretary under the Earl of Aberdeen, in Ireland, in 1852-1855; and in the latter year was transferred to the Ionian Islands as lord high commissioner. On the death of his father in 1848 he succeeded to the baronetcy, and in 1860 was sent to New South Wales as governor. His administration in that colony lasted nearly seven years, when he returned to England, and in 1868 was appointed governor-general of Canada, in which office he served till 1872, when he was succeeded by the Earl of Dufferin. He died in Ireland, Oct. 6, 1876.

YOUNG, JOHN RUSSELL, an American journalist; born in Downingtown, Pa., Nov. 20, 1841. He entered journalism in 1857 as a copyholder on the Philadelphia "Press"; and was rapidly promoted to

reporter, news editor, Washington correspondent, and at the outbreak of the Civil War was war correspondent. He remained with the Army of the Potomac from the battle of Bull Run to the end of the Chickahominy campaign, when he returned to Philadelphia ill, and became managing editor of the "Press." In September, 1865, he joined the editorial staff of the New York "Tribune"; in May 1866, became managing editor, retiring in 1869; established the "Morning Post" in Philadelphia; the "Standard" in New York (1869); was European correspondent of the New York "Herald" (1871-1877); as correspondent of the same paper he accompanied General Grant in his journey round the world (1877); resumed editorial work on the "Herald" (1879-1882); was appointed minister to China (1882); resigned in 1885 and came home; was appointed Librarian of Congress, June 30, 1897. He wrote "Around the World with General Grant" (1879), and edited "Memorial History of Philadelphia" and "Narrative and Critical History" (1895). He died in Washington, D. C., Jan. 17, 1899.

YOUNG, SAMUEL BALDWIN MARKS, an American military officer; born in Pittsburgh, Pa., Jan. 9, 1840; entered the Union army in 1861; served with distinction through the Civil War; and was brevetted Brigadier-General April 9, 1865. He joined the regular army as 2d lieutenant in May 1866; was promoted captain in July, 1866, and colonel, June 19, 1897; was commissioned a Brigadier-General of volunteers, May 4, 1898; and participated in the Cuban campaign; was promoted Major-General of volunteers, and honorably discharged after the surrender of Santiago; served in the Philippines in 1889-1901; was promoted Brigadier-General, U. S. A., Jan. 2, 1900; Major-General, Feb. 2, 1901; and for a time served as military governor of Northwestern Luzon and was commander of the 1st District, Department of Luzon. Later in the same year he was placed in command of the Department of California. In February, 1902, he was selected to be the first president of the newly-established Army War College, in Washington, D. C. He died in 1921.

YOUNG, THOMAS, an English scientist; born of a Quaker family in Milverton, Somersetshire, England, June 13, 1773. He qualified himself for the medical profession; but a fortune left him made him rather languid in his practice as a physician in London. In 1802 he became the colleague of Davy as Professor of Natural Philosophy at the Royal Institution, having previously made the discovery of the interference of light, the result of researches which, completed by Fresnel, secured the triumph of the undulatory theory. In 1807 appeared his admirable "Lectures on Natural Philosophy." In 1818 he was appointed secretary of the Board of Longitude, with the charge of supervising the "Nautical Almanack." Young preceded Champollion in the discovery of the alphabetic character of certain of the Egyptian hieroglyphs. He was a man of universal accomplishments, adding to his scientific and mathematical attainments a knowledge of the classical and the principal modern and Oriental languages. He died in London, May 10, 1829.

YOUNGHUSBAND, SIR GEORGE JOHN, a British military officer; born in 1859. He was educated at Clifton College and at Sandhurst, and entered the army in 1878, reaching eventually the rank of major-general. He served in the Afghan War (1878-1880); the Soudan (1885); the Burmah War (1886-1887); the Spanish-American War (1898); the South African War (1899-1902); and the World War (1914-1917). He was awarded many medals and other decorations and frequently mentioned in despatches. He was a Fellow of the Royal Geographical Society and in 1917 became Keeper of the Jewel House in the Tower of London. He wrote "Eighteen Hundred Miles on a Burmese Tat"; "Polo in India"; "Frays and Forays"; "The Queen's Commission"; "Relief of Chitral"; "The Philippines and Round About"; "Indian Frontier Warfare"; "Tournament Polo"; "The Story of the Guides"; "A Soldier's Memories" (1917).

YOUNG ITALY, a movement toward forming a republic in Italy, about 1834, led by Mazzini. There were similar associations in other countries, called "Young France," "Young Germany," "Young Poland," etc., the whole known as "Young Europe." See MAZZINI, G.

YOUNG MEN'S CHRISTIAN ASSOCIATIONS, organizations of young men in the different cities, demanding a profession of Christianity in their associate members, and working by methods in harmony with Christianity for the physical, social, mental, and spiritual improvement of their members, and of young men in general. An organization called Young Men's Christian Association, was first formed in London, England, by George Williams in 1844. The movement extended to the United States and Canada in December, 1851, when so-

cieties were formed at Montreal and Boston, Mass. About 24 associations were added during the next two years, and during the next 10 years the number reached 200. At the first convention, held in Buffalo, N. Y., June 7, 1854, a confederation was formed with a central committee, and a yearly convention. This form of affiliation continued till the Civil War. During the war the United States Christian Commission, formed in New York, November, 1861, sent 5,000 Christian helpers to the field and the hospitals, and distributed over $5,000,000 in money and stores. Guided by the experience gained at this period, the reorganized movement grew rapidly after the war on the following lines: The evangelical test of active membership, a definite and comprehensive plan of work, the ownership of well-adapted buildings, the employment of trained and paid officers, a committee of supervision for each State or Province, with a central committee for general oversight, systematic effort directed to special classes of men (*e. g.*, merchants' clerks, college students, railroad men, German speakers, colored men, Indians, lumbermen, sailors, soldiers, etc.), and great prominence given to the Bible and personal work. A typical Young Men's Association building contains a reception room, reading room, library, parlor, recreation room, offices, class rooms, lecture and entertainment room, gymnasium, including bowling alley, bath and dressing rooms, rooms for boys, kitchen, and janitor's den. Religious and moral instruction, work in behalf of personal purity, temperance, etc., instruction in various branches of knowledge, practical and theoretical, social gatherings, entertainments and games, an employment bureau, boarding house register, savings fund, medical club, and visitation of the sick, are features.

The association took a notable part in war work during the World War, both in the United States and France, and in other countries. In the spring of 1919, when this work reached its culminating point, there were nearly 1,000 establishments in the United States, and nearly 3,000 with the American Expeditionary Forces overseas and fully 2,000 among the army of the Allies and in prison camps, or in all over 6,000 centers. This made it necessary to enlist a staff of about 20,000 secretaries at home and overseas. The association distributed over 5,500,000 copies of the New Testament, the Bible, and other scripture portions, and at least 20,000,000 copies of religious pamphlets and booklets. 45 periodicals were published and over 400,000 sheets of letter paper and almost half as many envelopes were given away to the American soldiers overseas. The post exchanges for the A. E. F. were administered by the Y. M. C. A., and the operations were carried on on a vast scale. During 1919 over 11,000 men and women were sent to Europe to assist in the conduct of the work. The entertainment of the A. E. F. was in the hands of the Y. M. C. A., and there were at one time 95 entertainment troupes in France, furnishing about 4,350 performances a month. Educational facilities were provided for the troops abroad, including university courses at Beaune. Elementary courses were conducted in the United States, as well as high school and agricultural courses. The Y. M. C. A. carried on work in every part of the world affected by the war. See RELIEF, WAR. There were in 1919 557,782 men and 181,656 boys enrolled in membership. There were 2,077 fully enrolled associations, and the property in funds amounted to nearly $125,000,000. The income for the year amounted to almost $30,000,000.

YOUNG PRETENDER, THE, Charles Edward Stuart, of Scotland, who was defeated by the Duke of Cumberland, at Culloden, April 16, 1746. The Scotch lost 2,500 men killed on the field, or in the slaughter which occurred in the cruel pursuit, while the loss of the English did not far exceed 200. Prince Charles, who wandered among the wilds of Scotland for six months, while $150,000 were offered for taking him, at length escaped from Uist to Morlaix, and died in Rome, March 3, 1788.

YOUNGSTOWN, a city of Ohio, the county-seat of Mahoning co. It is on the Mahoning river, and on the Baltimore and Ohio, the Erie, the Lake Shore and Michigan Southern, the Pennsylvania, the Pittsburg and Lake Erie, and the Youngstown and Southern railroads. The city has 320 miles of streets, of which 168 miles are paved. There are 180 miles of sewers. The city has an excellent system of parks. Mill Creek Park includes 485 acres, and is one of the largest and most beautiful natural parks in the United States. The notable buildings include Mahoning Institute of Art, a court house, the Reuben McMillan Free Library, Y.M.C.A., and Y.W.C.A. buildings, and many handsome business buildings. There are 49 public school buildings, including two high schools. There are over 20,000 pupils enrolled in the public schools. The Catholic church maintains 12 schools, and there are several private educational institutions. The city has developed in recent years

into one of the most important industrial communities in the United States. The steel industry is the most important and to it the growth and importance of the city have been due. There are over 50 blast furnaces, producing over 7,000,000 tons of Bessemer steel, over 4,000,000 tons of open hearth steel, and 25,000 tons of castings. In addition there are coke oven plants and by-products plants of various kinds. Other industries include the manufacture of steel furniture and structural parts, steel sash, presses, steel buildings, asbestos, cement, shingles, cranes, engines, stoves, etc. Aside from the steel industry, there are manufactures of automobile trucks, flour, leather, powder, wagons, and rubber. The industries employ about 50,000 men. The city had an assessed valuation in 1919 of $215,260,960. There are five banks and three building and loan associations. Pop. (1910) 79,066; (1920) 132,358.

YOUNG WOMEN'S CHRISTIAN ASSOCIATIONS, societies devoted to the spiritual, mental, social, and physical development of young women. The first Young Women's Association was formed in London, England, in 1855. In the United States these associations grew out of the Ladies' Christian Union of New York, established in 1858, the first Young Women's Christian Association in this country being formed in Boston, Mass., in 1866. In 1871 there were three Young Women's Christian Associations and 27 other women's associations. The associations since 1871 have held biennial conferences. There is a distinct organization of young women's Christian associations in the colleges, all sprung from the first association in the State Normal University, Normal, Ill., in November, 1872. The work in Young Women's Christian Associations was at first modeled on that of the Young Men's Christian Associations, but it was found that women's needs required that it should be different. An important feature is the maintenance of boarding homes for young women. The associations in large cities have gymnasiums, educational classes, entertainments, lectures, employment bureaus, etc.

The work of the associations among women is fourfold: Physical—systematic training in the gymnasium, health talks, holiday excursions, and outing clubs; social—receptions and socials in home-like rooms, boarding clubs, employment bureaus; intellectual—libraries and reading rooms, educational classes, lecture courses, concerts, library, musical and art clubs; spiritual—Bible training classes, evangelistic meetings, personal work, Gospel meetings.

The association did valuable war work, especially among the women, during the World War, and following its conclusion there was planned a world program through which emergency work maintained during the war should be made permanent, and new work undertaken in other fields. The War Work Council carried on its work entirely in the interests of women and girls. The organization carried on efficient service in France, Czecho-Slovakia, Poland, Italy, Belgium, Rumania, Palestine, Constantinople, and in Russia, while it was possible to continue there. The amount expended for overseas work in 1919 was $3,000,000.

YPRES (ēpr) (Flemish, Y'peren), a Belgian town of West Flanders; on a fertile plain, 30 miles S. S. W. of Bruges, and 8 from the French frontier. Ypres was at one time one of the most important manufacturing towns in Flanders, the number of inhabitants in the 14th century being 200,000, and the number of looms 4,000. Its staple manufacture was DIAPER (*q. v.*). At the outbreak of the World War the only remnant of its once flourishing manufacture was the cloth hall (*Les Halles*), standing in the great market place, in a rich style of Gothic architecture, and surmounted by a stately square tower or belfry, with a clock and chimes. It was built 1230-1342, and restored in 1860; a part was added in 1730. There were fine frescoes in the great hall, and many statues on the outside. One of the wings was used as the city hall. The cathedral of St. Martin was a fine Gothic edifice (1221-1350), with an altar of Carrara marble, a richly carved pulpit, and a picture doubtfully attributed to Van Eyck. The chief modern manufactures were thread and lace. Ypres is a very old town, its origin dating from the 9th and 10th centuries. In 1688 it was strongly fortified by Louis XIV., and in the great European wars was frequently subject to sieges. Jansen was Bishop of Ypres. Some of the most severe fighting on the western front occurred in and around Ypres, and practically the entire town is now in ruins. Pop. before the World War about 20,000.

YPSILANTI, a city in Washtenaw co., Mich.; on the Huron river, and on the Michigan Central, and the Lake Shore and Michigan Southern railroads; 30 miles W. of Detroit. Here are the Michigan State Normal School, St. John's Academy, business college, Ladies' Public Library, electric lights, waterworks, National and savings banks, and a number of weekly newspapers. The city has

manufactories of condiments, dress stays, paper, woolen goods, etc., Pop. (1910) 6,230; (1920) 7,413.

YPSILANTI, a Fanariot family claiming descent from the Comneni. Its most conspicuous members are:

ALEXANDER, born 1725, a dragoman of the Porte, hospodar of Wallachia from 1774 to 1782, and again in 1790. He was carried prisoner to Brünn in 1792. Released, he returned to Constantinople, propounded a scheme for the fusion of the Greek and Turkish people, but having incurred the suspicion of the Porte, was executed in 1805.

CONSTANTINE, his son, born in Constantinople, in 1760, early planned the freedom of Greece. His scheme was prematurely discovered, and he fled to Vienna. Pardoned by the Sultan, he was hospodar of Moldavia from 1799 till 1805, when he went to Russia, but returned to Bucharest with 20,000 men, again bent on freeing Greece. But the peace of Tilsit interrupting his plans, he returned to Russia, and died in Kiev, July 28, 1816.

ALEXANDER, eldest son of the preceding, born in Constantinople, Dec. 12, 1792, followed his father to Russia, entered the army, and served with distinction in various campaigns. In March, 1821, he entered the Moldavia, and raised the standard of revolt among the Rumanians. Russia, however, frowned on his enterprise; the natives were apathetic, and he was defeated by the Turks at Dragaschen, near Galatz, June 19, 1821. He fled to Austria, and was interned at Munkacs, in Hungary. He died in Vienna, Jan. 31, 1828.

DEMETRIOS, brother of the preceding, born Dec. 25, 1793, served in the Russian army, and in 1821 went to the Morea, where he played a brilliant part in the struggle. But, though a brave soldier and a successful general, as his victory at Tripolitza and his splendid defense of Argos show, his influence was constantly undermined by the "native" party, who never forgot that he was a Fanariot, and therefore half a foreigner. In 1827, however, he was made Commander-in-Chief of the Greek army, but the unhandsome treatment he received from the government of Capo d'Istria compelled him to resign his post, Jan. 1, 1830. He then withdrew from public affairs, and died in Vienna, Jan. 3, 1832.

YRIARTE, CHARLES EMILE (i-ri-ärt') a French journalist, of Spanish descent; born in Paris, France, in 1832. Among his works are: "Spanish Society" (1864); "Parisian Portraits" (1865); "The Life of a Venetian Patrician in the Sixteenth Century" (1874); "Venice: Its History, Art, Industry, the City and Its Life" (1879); "Italian Sculpture in the Fifteenth Century" (1885); "Francesca da Rimini" (1882); "Cesar Borgia" (1888). He died in 1898.

YSAYE, EUGÈNE, a Belgian violinist; born in Liège, Belgium, July 16, 1858; studied at the Liège Conservatory; traveled extensively till his appointment as first violinist in the Brussels Conservatory; came to the United States in 1894; and appeared in Boston and New York with great success.

YSSEL, or **IJSSEL**, the name of several rivers in the Netherlands. The NIEUW YSSEL, one of the principal arms of the Rhine, leaves that river below Arnheim, flows N. E. for 16 miles to Doesburg, where it receives the OUDE YSSEL from Westphalia, then N. E., N., and N. W., through Gelderland and Overyssel, past Zutphen and Deventer, receiving the Borkel and Schip-Beek, emptying at Kampen by many arms into the Zuyder Zee, and forming a constantly widening delta. It is one of the five main arms of the Rhine, is 320 feet broad at Zutphen, 764 at Kampen, and 90 miles in length. The NEDER YSSEL, an arm of the Leck, which leaves that stream at Vianen, flows W. through Utrecht at Oudewater, enters Southern Holland and flows S. W. past Gouda to join the Maas, forming at its mouth the island of Ysselmonde.

YSSELMONDE, or **IJSSELMONDE** (ī'sl-mŏn-duh), an island of the Netherlands, opposite the mouth of the Yssel.

YSTAD, a seaport of Sweden, on the extreme S. coast, 55 miles E. S. E. of Copenhagen, and 85 N. N. E. of Stralsund. It has two churches, and manufactures of tobacco, chicory, sugar, soap, cloth, and leather. Ystad has a good harbor, is in regular steamboat communication with the chief Baltic ports, and is connected with the Southern Swedish railway by a branch line opened in 1866. There is considerable trade, chiefly in corn.

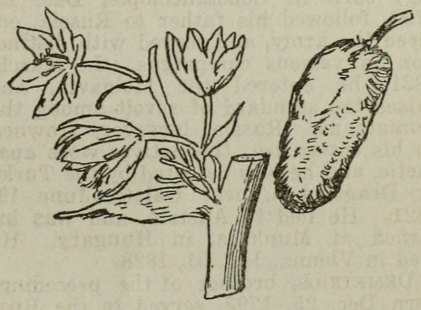
YTTRIUM, in chemistry, a dyad earth-metal, symbol Y, at. wt. 89, existing, together with erbium, as a silicate in gadolinite. It is obtained in the metallic state by digesting the mineral with hydrochloric acid, precipitating with oxalic acid, dissolving the oxalates formed in nitric acid, and separating by a series of fractional crystallizations; the erbium salt, being the less soluble of the two, crystallizing out first. On converting the nitrate into a chloride,

and igniting with potassium, the metal is obtained as a blackish-gray powder, consisting of small, metallic, lustrous scales. It unites directly, at high temperatures, with chlorine, oxygen, and sulphur, and probably with other metalloids.

YUAN SHIH-KAI, President of the Republic of China; born in Honan province. He entered the army after failing in his examinations on the Chinese classics and went to Korea, where he rose rapidly in the Chinese service, becoming a protégé of Li Hung Chang, who in 1883 had him appointed Director General of Trade and International Relations. Commanding the Chinese troops, he secured for the Chinese Government the domination of Korea and its emperor. Following the Chino-Japanese war of 1894-1895, which substituted Japanese for Chinese control in Korea, Yuan became Judicial Commissioner of Pechili province. He exposed the plot of 1898 which was aimed at the Empress Dowager Tze Hsi, but which resulted in the deposition of Emperor Kwang-sii, and of her return to power. As Governor of the Shantung province he pacified in 1899 the Boxer rebellion and became Acting Viceroy of the Pechili province in 1901. In 1903 he undertook the work of reorganizing the army and in 1907 became president of the Wai Wu Pu, the Chinese foreign office. When the infant Hsuan-tung succeeded in 1908, Prince Chun, his father and regent retired Yuan, but in 1911, on the fall of the Manchu dynasty, he became Commander-in-Chief and Premier. Following the revolution of 1911-1912 he was proclaimed "Fully Empowered Organizer of the Republic of China," being elected President, Oct. 6, 1913, for a five-year term. He expelled the southern senators and deputies from parliament, and on Jan. 10, 1914, dismissed the parliament, created an Advisory Council, with members appointed by himself, and restored the worship of Heaven and Confucius. Japanese demands resulted in a general sentiment for a return of a centralized monarchial government, and Yuan prepared for inauguration as emperor, but a revolt in the south postponed the ceremony. Before the plans could be further carried out he died, June 6, 1916, and the Republic of China continued.

YUCATAN (yö-kä-tän'), a peninsula forming the S. E. extremity of Mexico. Before its conquest by the Spaniards it was the seat of a flourishing civilization. It is now for the most part a sparsely cultivated region, whose forests yield excellent timber, cabinet woods, and dye woods, and which has recently been productive of great quantities of sisal or so-called Yucatan hemp. Five-sixths of the inhabitants are Indians, preserving the speech of their ancestors, whom the Spaniards dispossessed. In 1861 the peninsula, which since 1824 had formed one State in the Mexican Confederation, was divided into two: Yucatan and Campeche. Yucatan has an area of 35,203 square miles, and a pop. of about 350,000. Capital, Merida; pop. about 65,000. Campeche has an area of 18,087 square miles and a pop. about 90,000. Capital, Campeche; pop. estimated at 20,000.

YUCCA, Adams needle; a liliaceous genus doubtfully placed under *Tulipeæ*. Evergreen shrubs, their stem tending to arborescence, crowned by a circle of linear, lanceolate, rigid leaves, from the center of which rises a large panicle of snow-white, whitish-green, or cream-colored flowers. Perianth bell-shaped, its segments without nectaries; stamens clavate, style wanting, fruit capsular,



YUCCA

hexagonal, with three cells and numerous flat seeds. From the hotter parts of America. *Y. gloriosa*, common Adam's needle, has an upright stem, a panicle of flowers three feet long, and a total height in America of 10 or 12 feet, though the cultivated plant in Great Britain is very much smaller. It is a native of the United States from Carolina to Mexico and Texas. Its fruit is purgative; its stem yields starch and also a fiber well adapted for paper making. *Y. angustifolia* and *Y. filamentosa* have also fibers which may be similarly used. The last-named species, called the silk grass, has panicles of pendulous cream-colored flowers. It grows in British gardens, blossoming in the autumn.

YUGA, or **YOOGA**, in Hindu chronology, one of the periods into which the past history of the globe may be divided.

There are four yugas: The Satya Yuga, containing 1,728,000 years; the Treta Yuga, 1,296,000; the Dwapara Yuga, 864,000 years; and the Kali Yuga, now in progress, began about 3094 B. C., and which will extend to 432,000 years. Horace Hayman Wilson points out that these numbers originate in the descending arithmetical progressions of 4, 3, 2, 1, according to the notions of diminishing virtue in several ages applied to a cycle of 12,000 divine years, each equal to 360 years of mortals; and 12,000 × 360 is = 4,320,000, the periods of the four yugas added together.

YUKON, the largest stream in the extreme N. W. portion of the North American continent. It is 2,200 miles in length, the Mackenzie river, near it, being estimated at 2,300 miles. It is the 17th river of the world as to length, the seventh of the Western Hemisphere, the fourth of the North American continent, and the third in the United States. This last assertion is based on its whole length of 2,044 miles, however, but taking only that portion which is in the United States, or Alaska, 1,260 miles, it is the fifth river of our country, the Mississippi, Missouri, Arkansas, and Ohio rivers being longer. Its length in navigable miles is 2,036, there being but four rivers in the world with a greater capacity, the Amazon, the Mississippi, the Missouri, and the St. Lawrence. The entire portion lying in the United States (Alaska) of 1,260 miles is navigable by river steamers. The first absolutely impracticable obstruction to navigation is at the Grand Cañon, 1,866 miles from the mouth. The Yukon river rises in Crater Lake, on the E. slopes of the Alaskan coast range (here called Kotusk Mountains), in British Columbia. In a few miles it passes into the British Northwest Territory, flows N. by W. 784 miles, and enters Alaska about lat. 65° N. This direction is kept till the Arctic circle is just reached, when the Yukon river bends suddenly at almost right angles, flows W. by S. about 1,000 miles, and empties into Bering Sea by a delta whose N. and S. mouths are from 80 to 90 miles apart.

YUKON, a territory in N. W. British America; formerly a district of the Northwest Territories; created a separate territory in 1898. It lies in the W. portion, and just N. of British Columbia. It was brought into prominence by the discovery in 1897 of immense quantities of gold on the Klondike river and its tributaries. The gold-producing region extends about 80 miles N. and S., and is perhaps 50 miles in width. See KLONDIKE.

YULE, the old English name for Christmas, still used provincially, as well as in Yule log, Yule cake, Yule tide. For the nature of the old heathen festival, and the way in which the observances were overlaid or transformed by the Christian institution, see CHRISTMAS.

YULE, SIR HENRY, a British Orientalist; born near Edinburgh, Scotland, in May, 1820. Having entered the Indian army he served in the Sutlej campaign (1845-1846), in the Punjab (1848-1849), in Burma, and in the Indian mutiny, and became secretary to the Public Works Department, in which capacity he took part in several important surveys and missions. In 1875 he was appointed a member of the Home Council of India. Of the many works which he wrote and edited, the most noted is his admirable translation, with notes and maps, of Marco Polo (1871; augmented edition, 1875). He edited several volumes for the Hakluyt Society; and was a gold medalist of the Royal Geographical Society. He died in London, England, Dec. 30, 1889.

YUNG WING, a Chinese diplomatist, born in Nanping, China, Nov. 17, 1828; came to the United States in 1847; was graduated at Yale College in 1854; and in 1864 was commissioned by the Chinese Government to buy machinery in the United States for the arsenal of Kiang-Nau. In 1870 he proposed to the Chinese Government the settlement of claims for the massacre of Christians at Tientsin by establishing a line of steamers to carry a tribute of rice, the outgrowth of which was the celebrated China Merchant Steam Navigation Company. He was also influential in persuading the Chinese Government to provide for the education of Chinese youth in foreign countries, that intercourse with foreigners might be made easier. In 1875 he married Miss Mary Kellog of Hartford, Conn., an act which met with disfavor, with the Chinese authorities and led to his recall. In 1878, however, he was appointed assistant minister of China to the United States, where he remained till the outbreak of the Chino-Japanese War, when he was ordered to China. At the close of the war he was appointed one of the peace commissioners, but on the refusal of the Japanese to recognize him because of his rank he was replaced by Chang-Ten-Hoon. Subsequently he was raised in rank and in 1897 represented the Chinese Government at Queen Victoria's jubilee. He died in 1912.

YUNNAN (-nän'), the extreme S. W. province of China; bounded on the S. by

Annam, Siam, and Burma; on the W. by Burma; area, 107,969 square miles; pop. about 12,000,000. It is extremely rich in minerals, especially iron and copper, containing also many varieties of precious stones. At least a third of the cultivated land is said to be under the poppy. The inhabitants are for the most part Chinese; but there is a large number of non-Chinese Mohammedans (called by the Burmese Panthays).

The chief imports into Yunnan are raw cotton, cotton yarn, and piece goods; opium and tin are the chief exports. In 1869 the Mohammedans rose in rebellion against the Chinese Government, and succeeded in establishing an independent government, but it lasted only three or four years. By the convention of Chefoo in 1876 the establishment of commercial relations between British subjects and Yunnan was conceded by the Chinese Government.

In 1897 an agreement was made between Great Britain and China, supplementing the Frontier Convention of March, 1894, which laid down a boundary between Burma with its dependencies and Yunnan and made arrangements for trade, extradition, etc. The question of access to Yunnan and Szechuen is one of great importance to the commercial nations of Europe. The shortest route to Yunnan is through French territory by the Red river. There are competing routes through Burma. A part of Yunnan is most easily reached from Bhamo. The Indian railway system is being extended to Kunlong Ferry, on the Salween, from which a route to Talifu, and possibly on to Szechuen, may be found practicable. Another route for a railway has been suggested through Chiengmai and northern Siam. More important routes at present are by river up to the Canton or West river, or by the Yang-tze-kiang. By the agreement of Jan. 15, 1896, Great Britain and France agreed to share equally all privileges or advantages that might be conceded by China in the provinces of Yunnan and Szechuen.

YUNNAN, the capital, is in the S. E., and is a busy and prosperous town, with large copper factories, and manufactures of silks and carpets. Pop. 200,000.

YUSUF, or YUSSUF, ABU AMRU (yös'öf), an Arabic historian; born in Cordova, in 976. He was profoundly versed in the traditions of the Oriental Mussulman countries. He wrote: "Behedjet-Almodjalisyn," a collection of tales about Mahomet, etc.; "Tamhyd," a commentary on one of the chief Mussulman works of religious and civil law; "History of the Opinions and Doctrines of the Principal Mussulman Sects"; "History of the Wars Against the Christians"; etc. He died in Xativa, in 1070.

YUTHIA, or **AYODHYA**, the former capital of Siam; 40 miles N. of Bangkok; is almost encircled by the Méinan, whose fisheries furnish the town its principal employment. The German Mandelslohe in the 15th, and Portuguese Mendez Pinto in the 16th centuries, describe the marvels of this "Venice of the East"; but in 1768 it was razed to the ground by the King of Ava, and of its famous structures there only remains the "Golden Mountain," a neighboring pyramid 400 feet high, with a gilded colossal statue of Buddha. The modern town is the summer residence of many Bangkok merchants, and has an estimated population of 40,000, including many Chinese and Burmese.

YVERDON (ē-vär-dôn*g*'), or **YVERDUN**, a pleasant Swiss town of 6,300 inhabitants in the Canton de Vaud; at the S. end of the Lake of Neufchâtel; 20 miles N. of Lausanne. The old castle, built in 1135, was used by PESTALOZZI (*q. v.*) as an educational institute; and is now occupied by municipal schools, a library, and museum. There is a sulphur bath less than a mile out of the town.

YVETOT (ēv-tō'), an old town of France; in the department of Seine-Inférieure; 24 miles N. W. of Rouen. There are manufactures of linen, cotton, calico, and a trade in cattle and agricultural produce. The court and jail occupy the site of a Bernardine monastery (1650-1781). Pop. 7,007. The town and territory of Yvetot was long a semi-sovereign principality, and the Lord of Yvetot was popularly styled "King of Yvetot." This singular dignity was formally abrogated in 1681, but the people of Yvetot retained some privileges till the Revolution. Pop. about 8,000. Béranger's well-known song, "The King of Yvetot" (1812), translated by Thackeray, was a satire on Napoleon.

YVON, CLAUDE (ē-vôn*g*'), a French theologian; born in Mamers, France, in 1714. He wrote "Letters to Rousseau" (1763), in answer to Rousseau's letters to the Archbishop of Paris; earlier in life he had been associated with Diderot and the enclyclopedists, and wrote "Liberty of Conscience" (1754), in which he held that the state should be indifferent in matters of religion. Other works are: "Agreement of Philosophy and Religion" (1776), and "Philosophical History of Religion" (1779). He died in Paris in 1791.

Z

Z, z, the last letter of the English alphabet, a sibilant consonant, and mere vocal or sonant s, having exactly the same sound as s in please, ease, wise, etc. The words in modern English which begin with z are all derived from other languages, principally from Greek. It was not known in the oldest English. When not initial, it frequently represents an older s, as dizzy=Anglo-Saxon *dysig*, freeze=Anglo-Saxon *freosan*, etc. It also stands for a French c or s, as in nazard, lizard, buzzard, seize. Z has intruded into citizen=French *citoyen;* and it has changed into g in ginger=Latin *zingiberi.* As a final it occurs in some onomatopoetic words, as in buzz, whizz, etc. In German it is very common, being a double consonant with the sound of ts; and similarly in Greek it was also a double consonant, representing the sound of ds or sd. In Great Britain it is called zed; in the United States zed, or zee.

ZAANDAM, or **ZAARDAM**, a town in the province of North Holland; on the Zaan, at its entrance into the Y, 5 miles N. W. of Amsterdam. Many of its wooden houses, mostly painted white or green, are separated by canals, and with their gardens round them they look like little islands. It has many corn, oil, and saw mills, in whose products an active trade is maintained with the Baltic, Black, and White Seas; and also manufactures of paper, dyes, starch, tobacco, and glue, rope spinning, iron founding, and still a little shipbuilding. Most of the 60 wharves it had in the 17th century have disappeared, and its famous whale fishery is also a thing of the past. Here in 1697 Peter the Great worked in one of the shipbuilding yards as a carpenter, and the hut in which he lived is carefully preserved. It was visited in 1814 by the Czar Alexander. Pop. about 25,000.

ZABERN, the name of three German towns. (1) ELSASS-ZABERN (French, Saverne), a town of Elsass, on the Zorn, 27 miles N. W. of Strassburg. A Gothic Hauptkirche of the 15th century, a castle built in 1667, but now a barrack, and a museum with a collection of local antiquities, are the principal buildings. The Rhine and Marne canal passes through the town. Tanneries, potteries, and woolen mills are the chief industrial establishments, and there is considerable timber trade. The town stands at the mouth of the Zabern Pass, leading across the Vosges Mountains. The Roman Tabernæ, this town still contains traces of Roman occupation. It was long an ecclesiastical city belonging to the bishops of Metz, and an episcopal palace occupied the site of its present castle. Always a German town, though held for a time by France, it receded to Germany in 1871, and the castle, formerly occupied by the widows of members of the Legion of Honor, was employed as a barrack. (2) BROG-ZABERN, a town of Rhine Bavaria, on the Erlenbach, 8 miles S. of Landau. (3) RHEIN-ZABERN, a town of Bavaria, on the Erlenbach. The French here defeated the Austrians, July 29, 1793.

ZACATECAS, capital of a State of the same name in Mexico; is a famous silver mining town, in a deep ravine; 440 miles N. W. of Mexico City. The streets are narrow and irregular, but there are numerous squares, and the market place, where the cathedral stands, is fine and handsome. It contains a college, gunpowder mill, and mint. Three miles to the E. is the Franciscan college, where the fathers of the old Californian missions were trained. Zacatecas is the great silver producing State of Mexico. The mines since 1540 have yielded over $1,000,000,000. Pop. of the city about 25,000; of the State, about 475,000.

ZACHARIAS, father of St. John the Baptist, and husband of St. Elizabeth. He was a priest of the temple of Jeru-

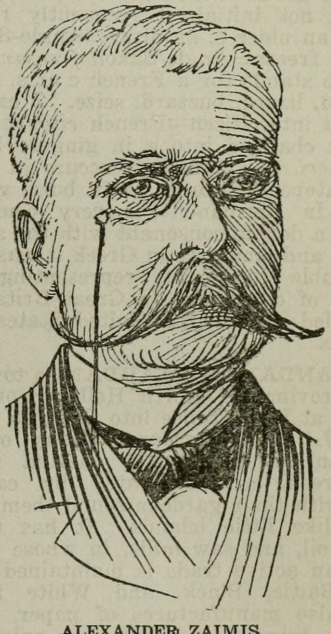
salem, and became dumb on refusing to believe the announcement, made by the angel Gabriel, that a son should be born unto him; but recovered his speech at the birth of St. John the Baptist. He is believed to have been put to death by Herod.

ZACHARIAS, also known as ZACHARY, Pope from 741 to 752; a Greek by birth. He gave his consent to the setting aside of the Merovingian Childeric III. and the elevation of Pepin the Short to the French throne (752). He died in Rome, March 14, 752.

ZAHN, THEODOR, a German theologian; born in Mörs, Prussia, Oct. 10, 1838. He was appointed Professor of Theology in the University of Erlangen in 1878, and wrote "Marcellus of Ancyra" (1867); "The Shepherd of Hermas" (1868); "Ignatius of Antioch" (1873); "The Acts of St. John" (1880); "Cyprian of Antioch and the German Story of Faust" (1882); "Researches Into the History of the New Testament Canon" (5 vols, 1881-1893); "The Gospel of Peter" (1893); "Introduction to the New Testament" (1897).

ZÄHRINGEN, the house from which the former grand-ducal family of Baden took its origin. The name is derived from the ruined castle of Zähringen, in a village of the same name, 2 miles N. of Freiburg in Baden. The first founders of the family were from the 8th to the 10th century Counts of Breisgau, but the authenticated history of the house really begins with Bertold I., "the Bearded," who became duke in 1050, was much esteemed by the Emperor Heinrich III., and received from him the reversion of the duchy of Swabia. He was, however, passed over in 1057 by Agnes, the widow of Heinrich III., in favor of Rudolf of Rheinfelden, and received in 1061 as compensation the duchy of Kärnthen with the march of Verona. He became reconciled with Rudolf in 1070, and fought by his side at Melrichstadt, Aug. 7, 1078. When he saw from Lintburg the devastation of his lands by Heinrich IV. he became insane, and died soon after—Nov. 8, 1078. His elder son, Hermann, had died in 1074, leaving a son, Hermann II., who married Judith of Baden, and from whom the present house of Baden is directly descended. The younger son of Bertold "the Bearded," Bertold II., Duke of Zähringen (died 1111), inherited the dominions of his father-in-law, Rudolf of Swabia, and was followed by Bertold III. (fell at Molsheim, March 3, 1122), the founder of Freiburg. His brother and successor Konrad, who founded Münster, was made in 1127 by the Emperor Lothar, "Rektor" of Burgundy, where his son Bertold IV. (died 1168) and his grandson Bertold V., the founder of Bern (1191), received rich possessions. As Bertold V. died childless (Feb. 18, 1218), his dominions fell to the nearest heirs, the Duke of Teck, who sprang from a brother of Bertold IV., and the elder Baden line. His Swabian possessions fell to his sister Agnes, the wife of the Graf von Urach, and his Swiss lands mostly to his youngest sister Anna, wife of the Graf von Kiburg. The remainder, including the towns Zürich, Bern, Solothurn, and Offenburg, fell by testament to the emperor.

ZAIMIS, ALEXANDER, a Greek statesman; born at Athens in 1855. He was educated in the academies at Athens, and entered politics, dabbling also to some extent in literature. He was elected to the Chamber at Athens and in 1906 was made High Commissioner of the Protecting Powers in Crete, a position he held till 1911. Later he became Prime Minister in Greece.



ALEXANDER ZAIMIS

ZALINSKI, EDMUND LOUIS GRAY, an American military officer; born in Kurnick, Prussian Poland, Dec. 13, 1849; came to the United States in 1853 and entered the army at the age of 15 as a volunteer aide-de-camp on the staff

of General Miles. He received a commission in the United States army in 1866, was promoted 1st lieutenant of artillery in 1867 and captain in 1887. From 1872 to 1876 he was Professor of Military Science at the Massachusetts Institute of Technology; was graduated at the Artillery School, Fort Monroe, in 1880, and at the School of Submarine Mining, Willets Point, several months later. In 1889 he was sent to St. Petersburg as military attaché to the American legation, remaining on duty for a year. He retired from active service in 1894. He wrote: "Notes on Telescopic Sights for Cannon"; "Deflection of Projectiles by Wind"; etc. He was the inventor of pneumatic dynamite torpedo gun which bears his name, the electrical fuse, an intrenching tool, a ramrod bayonet, a telescopic sight for artillery, etc. See DYNAMITE GUN. He died March 10, 1909.

ZAMBESI (zam-bē'zē), the most important river in southeastern Africa, and the largest flowing into the Indian Ocean. It has its source in several streams uniting in the far interior. It flows first S. E. and then N. E., then curves again to the S. E., and reaches the Indian Ocean by several mouths in the Mozambique Channel opposite Madagascar. The delta of the Zambesi covers an area of about 25,000 square miles, and commences about 90 miles from the coast, a little below the confluence of the main stream with the Shiré. The course of the whole river is about 1,600 miles, and it drains an area of 600,000 square miles. Its basin is separated from that of the Orange river on the S. W. by a slight watershed, and from that of the Limpopo on the S. by a mountain range. Its course as a whole is through fertile valleys and wooded plains; but the navigation is interrupted by rapids and cataracts, among the latter being the Victoria Falls, which are among the grandest in the world. The valley of the Zambesi is capable of immense development in the way of trade. The Portuguese Government has long exercised sway for 300 miles from the mouths of the river, and by the international arrangement of June, 1891, the river from the coast to the confluence of the Loangwe is recognized as being in Portuguese territory; the upper course is chiefly in British territory. The Zambesi and its affluents are now free to the flags of all nations.

ZAMORA, a very ancient town of Spain; capital of the province of the same name; on the Douro, 150 miles N. W. of Madrid. It is the see of a bishop suffragan of Santiago. Zamora was of great importance in the Moorish times, was strongly fortified, and has many interesting remains of mediæval architecture. The cathedral is a late Romanesque edifice. There are some linen and woolen manufactures. It has never recovered from the devastations of the French (1808-1809).

ZAMOSC, a fortified town of Poland, province of Lublin; on the Wieprz, 50 miles S. E. of the town of Lublin. It was laid out in 1588 in the Italian style by Jan Zamojski, and all its houses have arcades. Its fine castle, the four churches, the arsenal, and the town house are the chief buildings.

ZANELLA, GIACOMO (dzä-nel'lä), an Italian lyrical poet; born in Chiampo, Italy, in 1820. After studying for the priesthood, he became Professor of Philosophy and Italian Literature at the seminary in Vicenza. His work is noted for beauty of style and mastery of form; his most popular poem being "The Fossil Shell." His first volume of poems, "Verses," appeared in 1868, and was followed by several others. Among his poetic tales are: "The Little Calabrese" (1870); "Robin Redbreast" (1881); "Italian Literature in the Last Century" (1885). He died in Vicenza, Italy, May 17, 1888.

ZANESVILLE, a city and county-seat of Muskingum co., O.; on the Muskingum river, and the Baltimore and Ohio, Zanesville and Western and other railroads; 57 miles E. of Columbus. Here are a public library, high school, Female seminary, street railroad and electric light plants, several bridges across the river, National and private banks, and daily, weekly, and monthly periodicals. The principal interest is manufacturing. The city has blast furnaces, machine shops, foundries, glass factories, paper mills, potteries, flour mills, etc. Zanesville was named in honor of Ebenezer Zane, a pioneer settler. Pop. (1910) 28,026; (1920) 29,569.

ZANGWILL, ISRAEL, an English-Jewish novelist; born in London, in 1864. He began life as a London teacher, and while teaching, graduated at the London University. He edited the periodical "Ariel"; and published: "The Premier and the Painter" (1888, in collaboration), a romance; "The Bachelors' Club" (1891); "The Big Bow Mystery" (1891); "The Old Maids' Club" (1892); "Children of the Ghetto" (1892), a collection of stories; "Merely Mary Ann" (1893); "Ghetto Tragedies" (1893); "The King of Schnorrers" (1894); "The Master" (1895), a novel; "Six Persons,"

a comedietta; "Without Prejudice" (1896); "Dreamers of the Ghetto" (1898); "They That Walk in Darkness" (1899); "Melting Pot" (1908); "Italian Fantasies" (1910). He dramatized "Children of the Ghetto," which was brought out in the United States in 1899.

ZANTE, or **ZACYNTHOS**, the Zacynthus of the Romans and of the Greeks, one of the principal Ionian Islands; 9 miles from the N. W. coast of the Morea, and 8 S. of Cephalonia; about 24 miles long, 12 broad. In the W. it attains a maximum altitude of 2,486 feet; the center is fertile, formed by depression, and is mainly devoted to the growing of the dwarf species of vine, originally brought from Corinth, from which the dried currants of commerce are produced. Zante is mentioned in Homer with the epithet "woody," which is not apt at the present day, though it is justly called in an Italian proverb "the flower of the Levant." It is not volcanic, though thought to be so by the natives from the pitch wells and the not infrequent earthquakes. A large quantity of currants is exported annually, mostly to England, where, according to Lithgow the traveler, they were first introduced from Zante about 1550. Pop. about 50,000. **ZANTE**, the capital, the largest town in the Ionian Islands, is situated at the head of a small bay or harbor on the E. coast. It is the sce of a Greek protopapas, and of a Roman Catholic bishop. Pop. about 15,000.

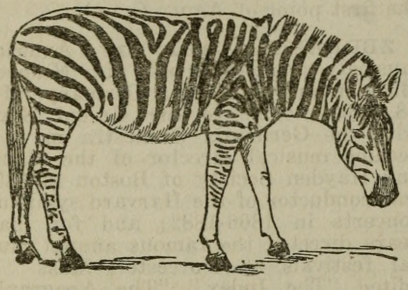
ZANZIBAR, a British protectorate in east Africa, which formerly comprised the whole coast between Magdishu (Magadoxo), about lat. 2° N., and Cape Delgado, lat. 10° 42′ S., with the four islands of Zanzibar, Pemba, Lamu, and Mafia. The continental part of the protectorate has become part of British East Africa and German East Africa; while the island and town of Zanzibar, and the island of Pemba, are entirely under British protection. The island (area 600 square miles) is very fertile and well cultivated, being especially suited for the cultivation of cloves, sugar, coffee, cocoa, and various spices, of which there is a considerable export. The population (200,000) is extremely heterogeneous, including Europeans, Arabs, half-caste Portuguese from the Malabar coast of India, and the Suahilis from the mainland. In 1899 Germany removed her rights of extra-territoriality in Zanzibar from such time as the similar rights possessed there by Great Britain should be abolished. The imports in 1899 had a value of $7,983,030, and the exports, $7,567,035. **ZANZIBAR**, the chief town (100,000 inhabitants), on the W. side of the island, is the center of trade for the E. seaboard of Africa and of missionary and exploring work for the interior. At the instance of the British Government the slave trade has been abolished and slavery was nominally abolished in 1897.

ZEALAND (Danish Själland), the largest and most important island of Denmark; lies between the Cattegat and the Baltic, and is separated by the Sound from Sweden and by the Great Belt from Fünen; length, 81 miles; extreme breadth, 67 miles; area, 2,670 square miles. The surface is nearly everywhere flat, except in the N. peninsulas; the coasts, which are rock-bound on the S. E., are indented by bays and fiords, the chief of which is the Roeskilde-Isefiord in the N. The rivers are small, but there are numerous lakes, and all the waters abound in fish. The island contains several beech forests, is excedingly fruitful in corn (particularly barley and rye), and breeds excellent horses and cattle. Agriculture and cattle-breeding are the principal employments of the inhabitants. The chief place is Copenhagen on the E. coast; the next in rank and size are Elsinore in the N. and Korsör in the S. W.

ZEALAND (Danish Själland), the ince of the Netherlands, consists of portions of Flanders (East and West) and of the islands Walcheren, North Beveland, South Beveland, Schouwen, Duiveland, and Tholen; area 690 square miles, and a pop. about 235,000, about three-fourths Protestants. The provincial capital is Middelburg; Flushing is also in Walcheren. The greatest part of the soil, which is a rich clay, has been redeemed from the sea; and the number of polders or drained districts, is about 400. The neighboring seas abound with fish, and in Schouwen many eggs are collected, myriads of waterfowl resorting thither to form their nests. In 1866 a ship canal through the island of South Beveland was made to take the place of the Easter Scheldt. Hence came the name of New Zealand.

ZEBRA, a popular name for any of the striped forms of the genus *Equus;* thus embracing the quagga, the true zebra, and Burchell's zebra. In all three the external characters are those of the ass rather than of the horse; the legs are without warts, the tail is furnished with long hairs only toward the extremity, the neck is full and arched, and the mane stiff and erect. All the species of this division are rapidly vanishing before advancing civilization, and in all

probability will become extinct before very many years. The true zebra is the *E. zebra*, from the mountainous regions of south Africa. It stands about 4½ feet at the shoulder; ground tint white, with black stripes, vertical on body and horizontal on legs; limbs slender, head light, ears long and open. The zebra lives in small herds in secluded spots; its sense of hearing, sight, and smell is



CHAPMAN ZEBRA

extremely acute, and on the least alarm the whole herd scampers off. When compelled to defend themselves zebras form a compact body with their heads in the center and their heels outward, and have been known to beat off the leopard with their kicks. The zebra has been domesticated, but its vicious temper renders it of little value as a beast of burden. Burchell's zebra (*E. burchellii*) differs little from the true zebra, except in the fact that the ground tint is yellow.

ZECHARIAH, or **ZACHARIAS**, the name of many ancient Hebrews, including two prophets, various priests, and Levites (I Chron. ix: 21; xv: 24; xxvi: 14; Neh. xii: 35, 41).

ZEDEKIAH, the son of Josiah, King of Judah, placed on the throne after Jehoiakin had been removed by Nebuchadnezzar, on his second taking of Jerusalem, 599 B. C. He reigned during 11 years, "and he did that which was evil in the sight of the Lord his God." He entered into an alliance with Pharaoh-Hophra, King of Egypt, and revolted against Nebuchadnezzar, who thereupon laid siege to Jerusalem. The prophet Jeremiah counselled Zedekiah to save his city and throne by submission to the Chaldeans; but the king, disregarding this advice, maintained his defense of the city. The Egyptians came to his relief; but, on Nebuchadnezzar offering them battle, they retreated to their own country, and Jerusalem, after undergoing a siege of 19 months (in the latter part of which a terrible famine raged), was taken, 586 B. C. The king endeavored to escape, but was captured, and condemned to behold his sons slain before him; after which his eyes were put out, and he was carried, bound with fetters of brass, to Babylon. The city was almost entirely destroyed, and the people led into captivity.

ZEITZ (tsīts), a walled town of Prussian Saxony; in the government of Merseburg, 23 miles S. W. of Leipsic. It lies in a pleasant and fruitful district on the right bank of the White Elster. The town has a good library, containing over 12,000 volumes, and manufactures of woolens, cottons, calicoes, sugar, wax cloth, leather, pianofortes, cycles, hosiery, gloves, etc. Pop. about 35,000.

ZEND AVESTA (usually interpreted to mean "authorized text" and "commentary"), the religious book of the Parsees or representatives of the old creed of fireworshipers. The original is written in the primitive Zend language, with a translation into the comparatively modern Pehlvi made by order of the Sassanian dynasty, A. D. 235-651.

ZENO, Emperor of the East from 474 to A. D. 491. One of the chief events of his reign, which was full of vissitudes, was the permission given by him to Theodoric to dethrone Odoacer, which led to the establishment of the Ostrogothic kingdom in Italy.

ZENO OF CYPRUS, a Greek philosopher, founder of the Stoic school; born in Citium, a small town in Cyprus, probably about 355 B. C.



MOUNTAIN ZEBRA

ZENOBIA, a Queen of Palmyra, who succeeded to the throne as regent for her sons on the murder of her husband Odenathus, A. D. 266. Not content, however, with the independence granted by the indolent Emperor Gallienus and his successor, Claudius, she aimed at a dominion which should include Egypt, Sy-

ria, and Asia Minor, and make good her vaunted title of Queen of the East. The accession of Aurelian, however, in 270, once more placed a soldier at the head of the Roman empire, and in 273 the armies of Zenobia were defeated in two pitched battles, while Palmyra was taken and its queen made prisoner. According to Zosimus she died on her way to Rome, but according to Trebellius Pollio, whose narrative is much more particular, she was led in triumph through Rome in the train of Aurelian, and was afterward presented by her conqueror with a villa at Tibur, where she passed the remainder of her life with her sons after the manner of a Roman matron. Zenobia was one of the most remarkable women of antiquity. She resembled Cleopatra in her talents and her personal fascination, and she far surpassed her in purity and elevation of character. "She is," says Gibbon, "perhaps the only female whose superior genius has broken through the servile indolence imposed on her sex by the climate and manners of Asia."

ZEPHANIAH, a prophet, son of Cushi, who again was the son of Gedaliah, son of Amariah, the son of Hizkiah (the king?).

ZERBST, a town of Germany in the republic of Anhalt, formerly capital of the principality of Anhalt-Zerbst; on the Nuthe, 26¼ miles S. E. of Magdeburg. The chief buildings are the Nikolaikirche, dating from the 15th century; the great Schloss, surrounded with a park; and the stately old Rathhaus, dating from the 15th century, but disfigured by additions in 1610, standing in the market place, in the center of which are the Roland column (1445), and the Butterjungfer, a slender column bearing a female figure. Zerbst contains a gymnasium of high repute—the Francisceum—and has manufactures of silks, plush, cloth, leather, gloves, gold and silver lace, soap, starch, essences, tobacco, chemicals, pottery, umbrellas, musical instruments, and machinery. Gardening, iron founding, and beer brewing are also carried on.

ZERMATT (tser-mät'), an important center for tourists in Switzerland; a small village near the upper end of the Visp valley in Valais; 25 miles S. S. W. of Visp. It stands 5,315 feet above the sea, having to the S. the great Théodule glacier, above which towers the Breithorn on the E. and beyond the Monte Rosa group, and on the W. the rocky cone of the Matterhorn. Railway communication was opened in 1890. The churchyard contains the graves of many of the victims of mountaineering. The Théodule Pass or Matterjoch (10,899 feet) leads to Aosta in Italy.

ZERO, in common language, nothing; in arithmetic it is called naught, and means no number; in algebra, it stands for no quantity, or for a quantity less than any assignable quantity; a cipher; nothing, denoted by 0. In astronomy, the first point of ARIES (*q. v.*).

ZERRAHN, CARL, an American musical conductor; born in Malchow, Mecklenburg-Schwerin, Germany, July 28, 1826; came to the United States with the Germania Orchestra in 1848; became musical director of the Handel and Hayden Society of Boston in 1854; was conductor of the Harvard symphony concerts in 1866-1882; and for many years directed the famous annual musical festivals at Worcester, Mass. He edited "The Index," "The Apograph," "The Atlas," "Carl Zerrahn's Selections," etc. He died in 1909.



ZEUS

ZEUS (zūs), the greatest of the national deities of ancient Greece; according to the most received mythology, son of Cronos and Rhea.

ZEUSS, JOHANN KASPAR (tsois), a German historian; born in Vogtendorf, Upper Franconia, July 22, 1806. Among his works are: "The Germans and the Neighbor Stocks" (1837); "The Descent of the Bavarians from the Marcomanni" (1839); "Witzenburg Traditions and Possessions" (1842); "The Free Imperial City of Spires from Its Destruction" (1843); "Celtic Grammar" (2 vols. 1853), his greatest work. He died in Vogtendorf, Nov. 10, 1856.

ZEUXIS (zūk'sis), one of the greatest Greek painters; born in one of the many cities named Heraclea, and flourished in the latter half of the 5th century B. C. He traveled a good deal, spending some time at Athens during the Peloponnesian War, visiting the court of Archelaus, King of Macedonia, and afterward Italy and Sicily. He excelled in form, light and shade, and coloring, in dramatic composition of grand subjects, and in imitation of inanimate objects. He made a large fortune, was extremely vain, and at last used to give away his pictures because he thought them worth more than any price that could be set on them.

ZHUKOVSKI, JOUKOVSKI, or SHUKOWS, VASILII ANDREEVICH, a famous Russian poet; born near Bielev, province of Penza, in 1783. He succeeded Karamzin as editor of the "Viestnik Evropui," 1808; was preceptor of the Emperor Alexander II. in his youth, as well of Alexander's mother. He wrote: "The Minstrel in the Russian Camp," a collection of spirited war ballads; "Ziudmilla," "Svietlana," his best work; etc.; and a number of prose essays and tales, the best known of which was "Mary's Grove." He made also numerous translations from the German, English, etc.; his translation of Gray's "Elegy" being one of the finest ever made. He died in 1852.

ZIEGLER, THEOBALD, a German philosophical writer; born in Göppingen, Württemberg, Feb. 9, 1846. He became Professor of Philosophy in the University of Strassburg in 1886. He was author of: "With Regard to Strauss's the Old Faith and the New" (1874); "Text-Book of Logic" (1876); "Republic or Monarchy: Switzerland or Germany" (1877); "History of Ethics" (1881); "The Social Question a Moral Question" (1891); "The German Student at the End of the Nineteenth Century" (6th ed. 1896).

ZIERIKZEE, a town of the Netherlands, in the province of Zeeland, and the chief town of the island of Schouwen, 3 miles from the Ooster Schelde (with which it is connected by two canal harbors), and 21 miles E. N. E. of Flushing. It has six churches, a fine town house, and a gymnasium, manufactures madder, carries on brewing and oyster fishing, and has considerable trade and shipping. It is the oldest town of Zeeland, and was formerly an important Hanse town.

ZIMBABYE, or GREAT ZIMBABWE (zēm-bäb'-wa), a notable ruin in Mashonaland; in lat. 20° 16′ 30″ S., and long. 31° 10′ 10″ E.; 3,300 feet above sea-level. It is the principal of a series of similar remains along the W. side of the Sabi river, and consists of a large elliptical building (280 feet long, with walls 35 feet high and 16 feet thick) on a gentle rise, with building extending into the valley, and an immensely strong labyrinthine fortress on the opposite hill, 400 feet above. The older buildings are beautiful examples of dry masonry. There is a considerable number of little images of the solar disk; while the two conical towers in the sacred inclosure on the lower hill, as well as the chevron ornamentation there, and various objects found in the citadel point to phallic forms of worship. The ruins evidently formed a garrison for the protection of a gold-producing race in remote antiquity, of whose work many traces have been found—a smelting furnace made of hard cement, clay crucibles with little specks of gold adhering, on ingot mold of soapstone, burnishers, crushers, carved soapstone birds, etc. Theodore Bent, who explored the ruins in 1891, assigned this enterprise to pre-Mohammedan Arabians (with possibly Phœnician influences), as both the objects of art and the special cult indicated are utterly foreign to the African races. K. Mauch would identify the region with the OPHIR (*q. v.*) of Solomon's time.

ZIMBALIST, EFREM, a Russian violinist; born in Rostow-on-Don, Russia, in 1889. He received his musical training under his father, and later studied in the Imperial School of Music at Petrograd with Leopold Auer. He made his first appearance in Petrograd at the age of 17. After touring through Germany and England, he came to the United States in 1911, where he appeared in all the leading cities and where he was very successful. In 1914 he married ALMA GLUCK (*q. v.*). He composed a number of songs and suites for violin and orchestra.

ZIMMERMANN, JOHANN GEORG (tsim'-mer-män), a Swiss physician and miscellaneous writer; born in Brugg, Aargau, Switzerland, Dec. 8, 1728. At

the University of Göttingen he studied under and was befriended by Haller, and eventually was appointed public physician to his native town. He became famous in his profession, and published several works on miscellaneous subjects, with one on "Experiences in Medicine," which procured him the appointment of physician for Hanover to George III. The loss of his wife and other domestic calamities brought on an attack of hypochondria, from which a second marriage relieved him, and as a result of his recovery he produced his once celebrated treatise on "Solitude" (1784), by which out of his own country he is alone remembered. In 1786 he attended Frederick the Great in his last illness, about whom he published two works, one of them "Conversations with the King," which involved him in painful controversy. Latterly he became deranged, and died in Hanover, Oct. 7, 1795. His "Autobiography" was issued in 1791.

ZIMMERN, HELEN (tsim'mern), a German-English story writer; born in Hamburg, March 25, 1846. From childhood she lived in England. She was author of: "Stories in Precious Stones" (1873); "Told by the Way" (1874); "Half-Hours with French Novelists" (1881); "Stories from Foreign Novelists" (2d ed. 1885). She wrote also "Schopenhauer, His Life and Philosophy" (1876); "G. E. Lessing, His Life and Works" (1878); "The Hansa Towns" (1889).

ZINC, a bluish-white lustrous metal, having a crystalline lamellar structure, moderate hardness, a somewhat low melting-point. To obtain it pure, commercial zinc, or spelter, as it is termed, is dissolved in pure dilute sulphuric acid; a cement of sulphuretted hydrogen is then passed through it, and it is filtered from any precipitate formed. The solution is then boiled to expel any sulphuretted hydrogen that may remain in it, and the zinc is precipitated in the form of carbonate by pure carbonate of soda. The carbonate is then ignited to form it into oxide of zinc, which is distilled in a porcelain retort, with charcoal prepared from loaf-sugar. Zinc is brittle at ordinary temperatures, but is possessed of considerable malleability and ductility at a temperature of between 200° and 300°, and may be wrought and rolled with ease. A little above this is becomes brittle again, and may be pulverized in a mortar. It fuses at 773° and at a bright red heat it may be volatilized. If its vapor is exposed to the air, it burns with great splendor, becoming converted into oxide, which is deposited in loose flocculi. At the ordinary temperature it is not acted on by the air, but when exposed to moist air or oxygen, it becomes covered with a tenacious gray coating of hydrated oxide, which impedes the further oxidation of the metal beneath. In this respect zinc rust differs from iron rust, which seems to accelerate the oxidation of the adjacent metal. By the conjoint action of oxygen and carbonic acid, zinc roofing becomes converted into a mixed oxide and carbonate. When melted in the air, the oxide is formed much more rapidly. The metal is readily dissolved by the mineral and vegetable acids. Boiling solutions of potash also act on zinc, hydrogen being liberated, and oxide of zinc remaining dissolved in the alkaline solution. The difficultly oxidizable nature of zinc, its cheapness, the ease with which it is extracted from its ores, and the ready way in which it may be worked, are bringing it daily more and more into use. Neither the vapor nor its oxide is poisonous.

It is of the greatest use in the laboratory for the precipitation of certain metals and for the formation of hydrogen. For voltaic purposes it is indispensable, and its principal alloy, brass, is too well known to need description. It forms alloys with iron and several other metals. The so-called galvanic iron is iron covered with a protective coating of zinc. It also enters the composition of German silver. The origin of the term zinc is lost in obscurity; it was first employed by Basil Valentine, but the great Paracelsus was the first to associate the word with a metal possessing the characters of zinc. It hardly seems probable that zinc was known to the ancients. An obscure passage in Strabo seems to show that a certain stone was found to drop false silver when melted, but there is little to show that this false silver was zinc. It is possible, however, that its alloys were known to the later Romans, for numerous coins have been found containing copper and zinc nearly in the proper proportions to form brass. It was not till the beginning of the 18th century that zinc was commercially extracted from its ores in Europe. Before this, however, it was imported by the Portuguese and others from the East Indies and China, under the name of tutenag and spelter. It seems first to have been made in England by Mr. Champion, of Bristol, about the year 1743. Long before zinc was known as a metal, brass was made in large quantities by heating metallic copper imbedded in a mixture of calcined calamine and carbonaceous mat-

ter. This was effected in large crucibles, which were exposed to a long-continued heat in furnaces constructed for the purpose. The zinc immediately on its liberation from the calamine of course united with the copper without giving any notice of its presence. The only use to which zinc was applied for many years after its discovery was for mixing with copper to form brass; and it was comparatively of late years that the fact of its becoming ductile and malleable when heated was made known. A patent was granted to the discoverers of this property, Sylvester and Hobson, in 1805, since which period the zinc manufacture has made steady progress.

Zinc has a considerable power of dissolving iron; in consequence of which the iron pots in which it is melted soon become corroded and unfit for use. Its specific gravity varies, according to the closeness of texture of the sample, from 7.03 to 7.2, or even 7.3. Zinc is abundantly distributed in the form of various ores throughout the whole world. Its principal ores are: Red zinc ore, which is found and worked in New Jersey. It consists of oxide of zinc, colored with binoxide of manganese. Carbonate of zinc, or calamine, found extensively in the Devonian and Carboniferous formations of most countries, especially near Lancaster, Columbia co., Pa., where mines were opened in 1853. Hydrated silicate of zinc, which is worked extensively in the United States. Sulphide of zinc, blende, or black jack, which is met with in large quantities in various parts of England and Europe. In the extraction of zinc from its ores, the blende or calamine is first crushed between rollers and roasted. In the case of the blende this is a tedious process, and requires great care. The result in either case is oxide of zinc, which is mixed with half its weight of powdered coke or anthracite, and introduced into crucibles of peculiar constructon. A circular furnace is employed, within which the crucibles are ranged. In the bottom of each crucible is an opening, to which a short iron pipe is attached, passing through the bottom of the furnace. To the end of this is affixed a removable tube communicating with a sheet-iron vessel. The hole in the bottom of the crucible having been partially plugged with coke, a charge of ore and coal is introduced, and the op of the crucible luted down. The tube connected with the iron vessel is lowered so as to leave the crucible tube open, and the heat is raised. So soon as the flame at the mouth of the short iron tube begins to turn from white to blue, connection is made with the tube leading to the iron pan, and the zinc gradually distils downward, partly in powder and partly in stalactitic masses. The crude metal is remelted, skimmed, and cast into ingots. In Silesia and Belgium retorts are used instead of crucibles, or per ascensum instead of per descensum. Zinc is often known in commerce as spelter, the derivation of which term is unknown. The equivalent of zinc, as determined by Erdmann, is 52.53.

Zinc only forms one oxide ZnO, which occurs in nature as red zinc ore. The anhydrous oxide is formed when zinc is burnt in air, and has been occasionally found in four and six-sided prisms in the flues of zinc furnaces. It is best prepared in the laboratory by calcining the precipitate produced by mixing solutions of sesquicarbonate of ammonia and sulphate of zinc. On the large scale, when it is required as a pigment, it is made by distilling zinc in clay retorts, passing into chambers through which a current of air is maintained. The volatilized metal burns at the high temperature to which it is exposed, and the oxide is deposited in the condensing chambers. As a pigment, it has not met with great success, as it does not wear so well as white lead, from its lesser specific gravity. In situations where it is exposed to sulphurous fumes, it stands perfectly; and being harmless in its nature, it is not open to the objections raised against its poisonous congener. Oxide of zinc forms a light white powder, which becomes yellow when heated, regaining its whiteness when it cools. It is a permanent oxide, even at the greatest heat. When exposed to the air, it becomes converted into a carbonate. It dissolves readily in acids, and its salts have the same form as those of magnesia and oxide of iron, with which it is isomorphous. Its salts, though neutral in composition, have an acid reaction. It is not easily dissolved in solutions of potash and soda, but if fused with them in a silver crucible, it forms compounds soluble in water in which the oxide of zinc appears to play the part of an acid. The hydrated oxide is formed by adding a solution of potash to the sulphate of zinc. It is readily soluble in excess of alkaline solution. In medicine, oxide of zinc is used in ointments as an astringent and desiccant, and by itself as a tonic, especially in cases of nervous debility brought on by drinking. Zinc is said to be a binoxide, but it requires confirmation. Nitrate of zinc is prepared by dissolving zinc in dilute nitric acid. It forms deliquescent four-sided prisms,

soluble in water and alcohol. Sulphate of zinc, or white vitriol, is manufactured on a large scale by roasting native sulphide of zinc (blende), extracting the mass with water, and evaporating to the crystallizing point. It is generally sent into commerce in white fused masses. Generally speaking, it contains six atoms of water of crystallization; but compounds containing less have been formed. It crystallizes ordinarily in four-sided prisms. It is used in medicine as an emetic, and very largely by calico printers. It is soluble in 2½ parts of water, but insoluble in alcohol. Several basic sulphates are said to exist. It combines directly with ammonia, forming a definite compound. It also forms double sulphates with those of potassa, ammonia, magnesia, and protoxide of iron. Carbonate of zinc, or calamine, occurs in nature in large amorphous masses, and occasionally in crystals of the same form as those of carbonate of lime. It is the chief ore of zinc, and is employed in its impure state in medicine as an exsiccant, and in healing cerates. The anhydrous carbonate may be prepared in the laboratory by placing a tube containing carbonate of soda in a strong tube containing sulphate of zinc, sealing the outer tube hermetically, heating it to 320° F., and inverting it so that the solution may mix; crystalline grains of the anhydrous carbonate are gradually deposited. No neutral carbonate of zinc can be obtained from its salts by double decomposition. Chloride of zinc is prepared by dissolving granulated zinc in hydrochloric acid, and evaporating, when it is obtained in a semi-solid hydrated mass, known as butter of zinc. If this be further heated, it fuses, becomes anhydrous and solid. It is deliquescent, fuses easily, and may be distilled. It is remarkably soluble in water, and its strong affinity for that substance renders it of great use as a desiccating agent in organic research. In solution it forms Burnett's disinfecting fluid. It is a powerful escharotic when applied to the skin, and is used in surgery for that purpose. It fuses above 700° F., but does not decompose unless more strongly heated; hence a bath of it is sometimes used for maintaining objects at a high temperature. Its solution absorbs ammoniacal gas with avidity. It forms double salts with the chlorides of the alkaline metals. Its solution is also much used in soldering zinc, iron, and copper. Its solution is also much used for preserving objects for dissection, as it does not corrode the instruments in the same way as corrosive sublimate. Several oxychlorides are said to exist. Sulphide of zinc, or blende, is found native contaminated with a large number of the other metals. It may be prepared by the direct combination of its elements. The hydrated sulphide is obtained as a white precipitate, by adding an alkaline sulphide to a solution of some zinc salt. There are several oxysulphides of zinc. The trisilicate of zinc, or electric calamine, is found native in several parts of the world. Heat develops electricity in it; hence its name. Valerianate of zinc is used in medicine in combating nervous disorders.

The production of spelter in the United States in the calendar year 1900 was 123,886 short tons, the largest on record. Illinois, Indiana, Kansas, and Missouri were the chief producing States. For the first time the United States became the exporter of both metal and ore in that year.

The production of primary zinc in the United States in 1919 was 452,272 short tons, valued at $66,032,000. Oklahoma ranked first in the production of zinc, with 121,988 tons; Illinois was second, and Kansas third. In 1919 the United States produced practically all the zinc smelted. Zinc imports in that year amounted to 48,649 tons of ore, 17,009 tons of zinc content, with a total value of $529,660. The exports of zinc in 1919 were valued at $50,530,132.

ZINGIBERACEÆ, gingerworts; an order of endogens, the typical one of the alliance Amomales. Aromatic herbs, with a creeping, often jointed rhizome. Stem simple, formed of the cohering bases of the leaves; leaves simple sheathing, with a single mid-rib, from which very numerous parallel veins diverge at an acute angle and proceed to the margin; flowers generally in pairs, and lying among spathaceous bracts; calyx superior, short, tubular, three-lobed; corolla, tubular, irregular, with six segments in two whorls, the inner, morphologically viewed, being transformed sterile stamens, untransformed stamens three, two of them abortive; filament of the former not petaloid; anther, two-celled; style filiform; stigma, dilated, hollow; ovary, more or less perfectly three-celled, with the placenta in the axis; fruit, usually a capsule, three, or sometimes one celled; seeds, many. Closely akin to *Marantaceæ*, with which they were formerly combined, but differ in their two-celled anther, and in the possession of a vitellus round the embryo. Natives of the East Indies and some other tropical countries. Genera, 29; species, 247.

ZION, or **SION**, the highest and most S. mount of Jerusalem; rising about 2,500 feet above the Mediterranean, and from

200 to 300 feet above the valleys at its base. It was separated from Akra on the N. and Moriah on the N. W. by the Valley Tyropœon; and had the valley of Gibbon on the W., that of Hinnom on the S., and that of the Kidron on the S. E. It was a fortified town of the Jebusites till subdued by David, and thence forward was called the "City of David." A mosque near its S. brow now covers the "tomb of David" so called, most jealously guarded by the Mohammedans. This mount, together with Moriah and Ophel, was inclosed by the first wall, and fortified by citadels. On it were erected the magnificent palaces of Solomon, and long afterward those of Herod. At the present day a considerable portion of it lies outside of the modern wall on the S. "Zion," and "the daughter of Zion," are sometimes used in Scripture to denote the whole city, including especially Moriah and the Temple; and sometimes figuratively for the seat of the true Church on earth and in heaven.

ZION CITY, a city of Illinois, in Lake co. It is on the Chicago and Northwestern railroad. It was founded by Charles Alexander Dowie. The industries of Zion City include the manufacture of lace goods, electrical supplies, office supplies, candy, baking supplies, etc. Pop. (1910) 4,789; (1920) 5,580.

ZIONISM, a name given to the plan for the acquisition of Palestine, with a view to establishing the Jews in the Holy Land. This ambition was to an extent realized following the World War, when Palestine became a protectorate of Great Britain, which officially assented to the establishment of a Jewish state. See PALESTINE.

ZIPHIUS, a genus of whales belonging to the family of the *Rhynchoceti*, or beaked whales. Ziphius occurs in the Mediterranean Sea and South Atlantic. The snout is pointed, there is a single blow-hole, and a small dorsal fin is developed. There are no teeth in the upper jaw, but the lower jaw is provided with from one to two pairs. *Z. Sowerbiensis* is a familiar species. The average length is 16 feet.

ZIRCON (ZrO_2, SiO_2), a mineral, silicate of zirconium, originally found in Ceylon, and forming one of the gems, being met with either colorless or colored—red, brownish-green, etc. Hyacinth and jargon are varieties.

ZIRCONIA (ZrO_2), the oxide of zircon, a hard white solid, "sticks" of which are sometimes used in the oxyhydrogen flame instead of lime.

ZIRCONIA LIGHT, an intensely brilliant light differing from the Drummond light mainly in the employment of cones of the oxide of zirconium instead of the less durable cylinders of lime. In 1867 Tessié du Motay introduced this light into Paris, and it was there employed for several years to illuminate squares and public buildings and gardens. The cones were formed of burnt zirconia kneaded into a paste withaqueous boracic acid, and hardened in iron molds at a red heat, and a mixture of oxygen and a highly carburetted gas was burnt to raise the cones to incandescence. The light was also once used as an illuminant in public places of Brussels and Vienna, and in the United States in lighthouses and public works.

ZIRCONIUM, Zr=89:6; a somewhat rare metal, intermediate in many of its properties to aluminum and silicum. Its oxide, zirconia, was first prepared by Klaproth in 1789 from the mineral zircon, which is essentially a silicate of zirconium, and is found crystallized in square prismatic or octahedric crystals.

ZIRKNITZ, or **CZIRKNICZ** (tsirk′nits), a lake of Austria; in Carniola, 30 miles E. N. E. of Trieste; about 5 miles long and between 2 and 3 broad, without surface outlet. It is remarkable for the occasional disappearance of its waters for weeks and even months, during which its bottom is often covered with luxuriant herbage. Its bed is composed of limestone, and full of deep fissures and caverns through which the waters disappear, returning when the rain sets in.

ZISKA OF TROCNOW, JOHN, a Hussite leader; born of noble parents, in Trocnow, Bohemia, about 1360. He spent his youth as a page at the court of King Wenceslaus; in 1410 joined the troops that marched from Bohemia and Hungary to help the Teutonic knights against the Poles and Lithuanians; and took part in the battle of Tannenberg, July 15. After this he fought in the campaigns of the Hungarians against the Turks, and on the side of the English against the French, especially distinguishing himself at Agincourt (1415). On his return to Bohemia, he attached himself to the extreme party of the Hussites, who under his leadership quickly became trained soldiers, and learned to fortify their camps by "Wagenburgen," *i. e.*, wagons so placed as to form defensive squares. In 1421 he founded a fortress on Mount Tabor, on July 14 of that year he defeated the German crusading army on the mountain ever since called Ziskaberg, and in January, 1422, he de-

cisively defeated Siegmund in the battle of Böhmisch-Brod. At the head of the Taborites Ziska then advanced against the moderate Calixtines, whose possessions he ravaged in the most wanton manner. Though at the siege of the Castle of Raby in 1421 he lost his second eye, he still continued not only to order the march, following his officers' descriptions of the ground, but to direct in battle his "invincible legion of brothers." The emperor had already begun to despair of success in the contest, and had opened negotiations with Ziska, promising full liberty of conscience, when the latter died, during the siege of Przibislaw, Oct. 11, 1424. He was buried in the Church of SS. Peter and Paul at Czaslau, with his battle axe suspended above his grave. In 1623 the tomb was opened by imperial command, and his bones removed to Vienna. Ziska was an able commander, quick in thought and action, of great presence of mind, and of iron firmness, a merciless and relentless opponent of the enemies of his country and his faith.

ZITHER (tsit'ur), or **ZITHERN** (tsit'urn), a development of the musical instrument known to the Greeks as cithara. In the early part of the 19th century it became a favorite with the peasantry of the Styrian and Bavarian Alps, and was introduced into England about 1850, chiefly by Herr Curt Schulz. The zither consists of a resonance box, with a large circular sound hole near the middle; the strings, 32 in number, in some cases increased to 40 and even 46, being made of steel, brass, catgut, and silk covered with fine silver or copper wire, and tuned by pegs at one end. Five of the strings are stretched over a fretted keyboard, and are used to play the melody, the fingers of the left hand stopping the strings on the frets, the right-hand thumb, armed with a metal ring, striking the strings, which are tuned in fifths, and have a chromatic range from c in the second space of the bass staff to d in the sixth ledger line above the treble. The remainder, called the accompaniment strings are struck by the first three fingers of the right hand, and, as they are not stopped, produce only the single note to which they are tuned. While playing, the performer rests the instrument on a table with the keyboard side nearest to him. The viola zither, in which the resonance box is heart-shaped, is tuned like the violin, and is played with a bow. The form of the instrument is like that of the viola, but the body rests on the lap of the seated player, while the head is placed on the edge of a table.

ZITTAU (tsit'tou), a town of Saxony; on the Mandau, near its junction with the Neisse; is an important railway center, 26 miles S. E. of Bautzen and 21 S. S. W. of Görlitz. The chief buildings are the Church of St. John and the Byzantine Rathhaus. Zittau stands in the center of a district rich in lignite, and in its neighborhood is a group of busy manufacturing villages. It is also the center of the linen and damask industry of Saxony, and has manufactures of woolens, besides bleach-fields, dye works, and iron foundries. Pop. about 40,000.

ZITTEL, KARL ALFRED VON, a German geologist and palæontologist; born in Bahlingen, Sept. 25, 1839. He became professor in the University of Munich in 1866. He was author of "Travels in Sweden and Norway" (1860); "From Primordial Time" (2d ed. 1875); "Letters from the Libyan Desert" (1875); "The Sahara" (1885). Died in 1904.

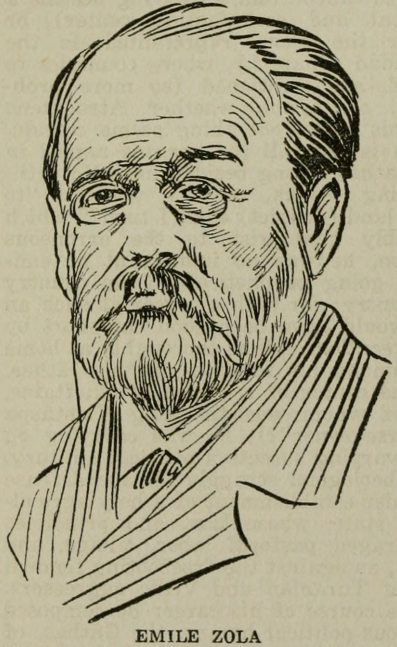
ZODIAC, in astronomy. The zone or broad belt of constellation which the sun traverses during the year in passing around the ecliptic. The moon and major planets also move within the same area. The breadth of the zodiac is about eight and a half degrees on each side of the ecliptic, or 17 in all. It is inclined to the equinoctial at an angle of 23° 28′, the points of intersection being reached by the sun, one at the vernal and the other at the autumnal equinox. The great circle of the zodiac was divided by the ancients into 12 equal portions called signs. They were named from the constellations then adjacent to them in the following order: Aries, the Ram; Taurus, the Bull; Gemini, the Twins; Cancer, the Crab; Leo, the Lion; Virgo, the Virgin; Libra, the Balance; Scorpio, the Scorpion; Sagittarius, the Archer; Capricornus, the Goat; Aquarius, the Waterbearer; and Pisces, the Fishes. The sun formerly entered Aries on March 20; now, owing to the precession of the equinoxes, the point of the heavens intersected by the celestial equator and the ecliptic, technically called the first point of Aries, has moved well into Pisces.

ZODIACAL LIGHT, a pearly glow spreading over a portion of the sky near the point at which the sun is just about to rise in the morning, or has just set in the evening. It extends from the horizon to a considerable distance toward the zenith, and is best seen in the tropics in spring evenings, about the time of the vernal equinox. In the latitude of London it is seen chiefly in the W. part of the sky in early spring after the evening

twilight, and at the close of autumn before daybreak in the E. horizon. The generally accepted theory of the zodiacal light is that it consists of a continuous disk, whether of meteors or any other substance, in which the sun is central.

ZOE (zō'ē), Empress of the East, daughter of Constantine VIII.; became the wife of Romanus III. in 1028, when she was in the 48th year of her age. She was a debauched woman, and became the murderess of her husband, in order to place her lover on the throne, who reigned under the title of Michael IV. The latter dying, was succeeded by his nephew, Michael V., who was deposed by the people, and Zoe and her sister Theodora proclaimed joint sovereigns. She displayed great ability and firmness in the government, and in 1042 married Constantine Monomachus. She reigned till her death at the age of 70, in 1050.

ZOISITE (after Baron von Zois), an orthorhombic mineral formerly regarded as a variety of epidote, but now shown to be a distinct species; hardness, 6-6.5; sp. gr., 3.11-3.38; luster, pearly on cleavage faces, vitreous elsewhere; color, shades of gray, apple green, peach blossom to rose red.



EMILE ZOLA

ZOLA, EMILE, a French novelist; born in Paris, France, April 2, 1840; the son of an Italian engineer. After working for Paris publishers and writing for the press he attempted fiction with success. He first appeared as a novelist in "The Mysteries of Marseilles." "Thérèse Raquin" further exhibited his remarkable power of critical analysis of human nature. "L'Assommoir," perhaps his most popular work, has gone through 50 editions. Author of "Nana," "Pot Bouillé," "The Earth," "The Human Brute," and other works. M. Zola was appointed a Knight of the Legion of Honor in 1888, and elected (April, 1891) President of the Society of Men of Letters. In 1892 he published "The Downfall," and "Doctor Pascal" in June, 1893. This book was the final volume of the famous Rougon Macquart series of 20 volumes, and was dedicated to the memory of M. Zola's mother and to his wife. During 1894 he published "Lourdes," a love story, set in the scenery of the famous resort of French pilgrims. "Rome" followed in 1896, "Paris" in 1897, and "Fecundity" in 1899. During 1897 and 1898 he took up with splendid courage the cause of Captain Dreyfus, whom he declared to have been illegally condemned, and was, consequently, prosecuted by order of the government, and condemned to imprisonment. He escaped to England. He died Sept. 29, 1902.

ZOLLVEREIN (tsōl'fer-īn), the German commercial or customs union, founded originally in 1827, but extended greatly after the war of 1866, when, owing to political considerations, Prussia obtained a preponderating influence in the union, which included the North German Bund, Bavaria, Württemberg, Baden, Hesse, and Luxemburg. This arrangement was brought prematurely to an end by the formation of the German empire. By article 33 of the constitution of the empire, the territory of the Zollverein coincides with the territories of the empire, with the exceptions of the free ports of Hamburg, Altona, Bremen, Bremerhaven, Geestemünde, and Braahe, and some communes of the grand-duchy of Baden, while Luxemburg and the Austrian canton of Jungholz are included in it. Its object is the regulation of a uniform rate of customs duties throughout the various states comprised in the union. The free ports were included in the Zollverein in October, 1888. Hence, any commercial or customs union.

ZONE, in anatomy, a region of the body formed by imaginary lines drawn around it transversely; used specifically of the abdominal zones or regions. In biology, a stripe or belt, as of color, on a plant, a shell, etc. Also a certain stratum of sea water, the depth of the upper and under surfaces of which are gener-

ally measured or calculated in fathoms. There are five zones to mark the bathymetric distribution of marine animals. Some of them are named from the distribution of sea plants, which also they mark:

The Littoral Zone, between tide marks; the Laminarian Zone, from low water to 15 fathoms; the Carolline Zone, from 15 to 50 fathoms; the Deep-Sea Coral Zone, 50 to 100 fathoms; the Abyssal Zone, beyond 100 fathoms.

In geography, one of the five imaginary belts surrounding the earth. They are the North Frigid Zone, between the North Pole and the Arctic Circle; the North Temperate Zone, between the Arctic Circle and the Tropic of Cancer; the Torrid Zone, between the Tropic of Cancer and the Tropic of Capricorn; the South Temperate Zone, between the Tropic of Capricorn and the Antarctic Circle; and the South Frigid Zone, between the Antarctic Circle and the South Pole.

In geology, zones are particular beds in the stages or divisions of certain geological formations, as, the primordial zone. In mathematics, the portion of the surface of a sphere included between two parallel planes. Ciliary zone, in anatomy, a term for the appearance which the pigment between the ciliary processes leaves on the hyaloid membrane, like the disk of a flower; also called *Corona ciliaris*. Isothermal zone, in geography and meteorology, the space between two isothermal lines.

ZOÖLOGICAL GARDEN, a public garden in which a collection of animals is kept. The gardens of the Zoölogical Society, Regent's Park, London (familiarly termed "the Zoo"), founded in 1828, are probably the finest of the kind in the world. They belong to the Zoölogical Society of London, which was founded in 1826. Of the other chief zoölogical gardens, the Jardin des Plantes in Paris is the oldest, having been founded in 1794. The most important zoölogical gardens in the United States are in New York, Philadelphia, Cincinnati, Chicago, St. Louis, and San Francisco. The S. E. section of Bronx Park (654 acres), New York, comprising 261 acres, is in charge of the New York Zoölogical Society, who have developed there the most extensive zoölogical garden in the country and one of the best in the world.

ZOÖLOGY, that portion of natural history which treats of the classification, structure, habits and habitations of animals. Closely related to zoölogy is the study of embryology, while comparative anatomy and physiology are the branches which dominate the study of the physical structure of man.

ZORNDORF (tsorn'-), a village of Brandenburg, Prussia; 53 miles E. by N. of Berlin. Here a battle was fought Aug. 25, 1758, between the Prussian and Russian armies; the former, commanded by the King of Prussia, obtained a victory over the forces of the czarina, whose loss amounted to 21,529 men, while that of the Prussians was about 11,000.

ZOROASTER (so the Greeks pronounced the name of ZARATHUSHTRA), the founder or reformer of the ancient religion of the Parsees. He appears as a historical person only in the earliest portion of the Avesta, the Gâthic hymns, where the aspirations, hopes, and fears of an actual human agent are unmistakably present. His name means "Bay camels." His father was Pourusaspa, "Many horses"; his wife was Hvogvi (*i. e.*, of the Hvogvas); his daughter was Pouru-chista, the Discreet. His family name was Spitama. This much we may accept from the statement of documents, but as soon as we leave the last Gâtha, which was the wedding song of his daughter, we have no reliable data. Whether he was born in Ragha, the "Zarathushtrian" province (possibly later so called from its having become a political and ecclesiastical center), or nearer the scene represented in the Vendîdâd (chap. i.), where countries to the E. are mentioned (so more probably), or, again, whether Atropatene was his home, one thing seems certain, which is that all the persons named in the Gâthas belong beside him. Notwithstanding Yasna, xlvi. 1, with its "to what land (district) shall I turn?" which probably gave rise to the erroneous opinion, he was no immigrant or emigrant going prophetically from country to country; for such a career at such an age would have been soon cut short by his execution. He is thoroughly at home and among his relatives in the Gâthas. As the center of a group of chieftains, one of whom was the king Vîshtâspa ("Horse-owner"?), he was carrying on with varying success a political military, and theological struggle for the defense or wider establishment of a holy agricultural state, whose laws and principles encouraged pastoral labor, tillage, and thrift, as against the freebooting tendencies of Turanian and Vedic aggressors. In the course of his career he composed religious-political hymns, the Gâthas, of which we have now only fragments surviving in meters which appear (or reappear) in the Rik and in other parts of the Veda. The period in which he lived is even more uncertain than that of Homer, but cannot be placed later than

800 B. C., and may be greatly earlier. See PARSEES.

ZOSIMUS, a Greek historian; author of a "History of the Roman Emperors" from Augustus to A. D. 410. In this work, which is ably executed, he inveighs bitterly against the Christian emperors, particularly Constantine and Theodosius I. The best edition of Zosimus is that of Bekker (1837), forming a volume of Niebuhr's "Corpus Scriptorum Historiæ Byzantinæ." An English translation of the history appeared in 1814 (Military Library).

ZOUAVE, a soldier belonging to the light infantry corps of the French army, which were organized in Algeria soon after the conquest of that country in 1830, and were originally intended to be composed exclusively of the Kabyle tribe. This idea, however, was soon abandoned, and since 1840 the corps has been composed almost entirely of French soldiers, recruited from the veterans of ordinary line regiments, who are distinguished for their fine physique and tried courage. They still, however, retain the picturesque dress originally adopted, consisting of a loose dark-blue jacket and waistcoat, baggy Turkish trousers, yellow leather leggins, white gaiters, a sky-blue sash, and a red fez with yellow tassel. The few corps composed of Algerines still connected with the French army are now known as Turcos. The name was also given to several regiments which served on the side of the North in the American Civil War, but these were only distinguished from the other volunteer regiments by their picturesque uniform.



COUNT NIKLAS ZRINYI

ZRINYI, COUNT NIKLAS, a Hungarian military officer; became famous for his defense of Sziget with 3,000 men against a Turkish army in August-September, 1566. While the enemy was forcing a narrow bridge leading to the castle on September 7, he ordered the gates to be opened and after firing a mortar filled with broken iron into their midst sallied forth at the head of 600 men. He was soon mortally shot, and several thousand Turks swarmed into the castle, where a mine of 3,000 pounds of gunpowder exploded immediately after their entrance, causing great carnage.

ZSCHOKKE (tshok'kā), **JOHANN HEINRICH DANIEL**, a German author; born in Magdeburg, Germany, March 22, 1771. He was educated at the University of Frankfort-on-the-Oder, and settled in Switzerland, in which country he held an honored position in connection with education and public affairs, and with the press. His autobiography, several of his tales, and the "Hours of Devotion," have been translated into English. He died in 1848.

ZUEBLIN, CHARLES, an American educator and publicist; born in Pendleton, Ind., in 1866. He was educated at the University of Pennsylvania, Northwestern University, Yale, and the University of Leipzig. In 1891 he founded the Northwestern University Settlement. In 1892 he became the first secretary of the Chicago Society for University Extension. From 1892 to 1895 he was instructor; from 1895 to 1896 assistant professor; from 1896 to 1902 associate professor; and from 1902 to 1908 full professor of sociology at the University of Chicago. In 1911-1912 he was editor of the "20th Century Magazine." He lectured extensively and contributed frequently to philosophical and sociological journals, and to many of the most prominent magazines and reviews. From 1901 to 1902 he was president of the American League for Civic Improvement. He wrote: "American Municipal Progress" (1902); "A Decade of Civic Development" (1905); "The Religion of the Democrat" (1908); "Democracy and the Over-man" (1911).

ZUG (tsög), a central and the smallest undivided canton of Switzerland, bounded by Zürich, Schwyz, Lucerne, and Aargau. The surface, which is generally mountainous in the S. E. and S., where the Rossberg occupies the frontier slopes more or less gradually N. and W., till it becomes comparatively flat. The only lakes deserving the name are those of Zug and Egeri. The climate, rigorous in the mountainous districts, is mild on the lower S. slopes. The chief exports are cattle, fruits, cider, and "kirschwasser." Area, 92 square miles; pop. about 25,000. ZUG, the capital,

stands on the N. shore of the lake, is 12 miles N. E. of Lucerne, with which and with Zürich it is connected by railway.

ZUG, LAKE OF, or **ZUGERSEE,** a small body of water lying chiefly in the canton of Zug, Switzerland, 9 miles long N. to S., and in breadth from 3 miles to 1 mile. The shores are low in all directions except the S. and S. E. In the former direction the Rigi with Mount Pilatus towering behind it, and in the latter the Rossberg, rise in lofty precipices, presenting scenery of a grand description. At the foot of the Rossberg the lake is 1,200 feet deep. The fishing, principally pike and carp, is productive.

ZUIDER ZEE, a large gulf of the North Sea, penetrating deep into the Netherlands; about 60 miles in length, and 210 miles in circumference. The islands Texel, Vlieland, Ter Schelling, Ameland, and Schiermonnikoog, reaching in a chain from the most N. point of Holland, are the remains of the former line of coast, and form a breakwater against the North Sea. From Dunkirk in French Flanders to the N. of Holland the interior is defended from the sea by sandhills or dunes. Here, as at the mouth of the Scheldt, the sand barrier was broken, and in 1282 the waters overflowing the low lands separated the province of Friesland from the peninsula of North Holland, and, having united with the small inner lake Flevo, formed the present Zuider Zee. In it lie the islands Wieringen, Urk, Schokland, and Marken. From the S. W. of the Zuider Zee a long narrow arm, called the Y (pronounced *I*), formerly ran nearly due W. through the peninsula of Holland. A strong sea dyke and locks have been constructed to cut off the Zuider Zee from the Y, through which there is a broad ship canal between Amsterdam and the North Sea. On both sides of the canal the Y has been drained and turned into about 12,000 acres of rich land. The waterway was formally opened by the king in 1876.

ZULULAND. See NATAL.

ZULUS, or **AMAZULUS,** that branch of the great Bantu division of the human family found in Natal, South Africa. Among the Bantu tribes, the Zulus are conspicuous for their physical and intellectual development.

ZUMALA-CARREGUY, TOMAS, a Spanish military officer, the greatest of the generals of Don Carlos during the civil war of 1833-1840; born in Ormaiztegua in the Biscayan province of Guipuzcoa in 1789. He left his studies at Pampeluna to fight under Mina against Napoleon, and afterward served under Quesada in the "Army of the Faith"; and on the reëstablishment of absolutism he was promoted colonel and appointed governor of Ferrol. For his leaning to the party of the Carlists he was tried by court-martial but acquitted, in 1832 with other Carlists he was dismissed from the army. But in 1833 the rising of the Basque population called him to head the Carlist insurrection. His motley army was without uniform, ill fed, and ill paid, yet the vigor and personality of "el Tio Tomas" (Uncle Thomas) were such that he was able to maintain effective discipline. He kept his opponents at bay, defeated Rodil in the valley of Amescoas, routed another force of Christinos at Viana, gained a second victory in the Amescoas valley, completely defeating Valdez, after a battle of four days, and rounted Iriate near Guernica. These brilliant successes turned the weak head of Don Carlos, and led him to interfere with the plans of his daring and devoted general, who was anxious to strike for Madrid when the Christinos were paralyzed with terror. Zumala-Carreguy was ordered to lay siege to Bilbao, but was mortally wounded by a musket ball, and died 10 days later, June 15, 1835.

ZUMPT, AUGUST (tsömpt), a German classical philologist, nephew of Karl; born in Königsberg, Germany, Dec. 4, 1815. His studies had to do mainly with Roman epigraphy in its relation to history. His principal works are: "The Ancyran Monument" (1845); "Epigraphical Notes" (2 vols. 1850-1854); "Roman Studies" (1859); "Criminal Law under the Roman Republic" (4 vols. 1865-1869); "The Birth-Year of Christ" (1869); "Criminal Trials under the Roman Republic." He died in Berlin, April 22, 1877.

ZUMPT, KARL, a German classical philologist; born in Berlin, Germany, March 20, 1792. He was appointed Professor of Roman Literature in the University of Berlin in 1836. His greatest work, the "Latin Grammar" (1818; 13th ed. 1874), was translated into English, and is the basis of several of the Latin grammars since compiled for the use of schools. He also prepared annotated editions of several of the Latin classics; and wrote: "Annals of Ancient Kingdoms, Nations, etc." (1819), in Latin; "The Roman Knights and the equestrian Order" (1840); "On the Duration of the Philosophic Schools at Athens, and the Succession of the Scholarchs" (1843); "On the Law and the Proofs of Extortion" (Repetundarum; 1845); "The Personal Liberty of the Roman Citizen, and

its Legal Guarantees" (1846). He died in Karlsbad, June 25, 1849.

ZUNZ, LEOPOLD (tsönts), a German author; born in Detmold, Germany, Aug. 10, 1794; became head-master of the Jewish Normal School for Teachers in Berlin. He was the founder of the "Science of Judaism," the plan of which was laid down in his "A Little about Rabbinic Literature" (1818). Very important was his work "Jewish Teachings Regarding Worship" (1892). Among his other works are: "The Synagogue Poetry of the Middle Ages"; "The Names of the Jews" (1836); "Jewish Requirements as to Oaths" (1859). He died in Berlin, March 17, 1886.

ZURBARAN, FRANCISCO, a Spanish painter; born in Fuente de Cantos, Estremadura, Spain, in 1598. His genius showing itself early, he was sent to Seville, where he studied the art under Juan de las Roelas. His style bears a strong resemblance to, and is probably an imitation of, that of Caravaggio; so that he early acquired the title of the Spanish Caravaggio. Most of his works are at Seville, and among them his picture of "St. Thomas Aquinas" is considered the best. He was some time employed at Madrid, and had the title of painter to Philip III. and Philip IV. He died in 1662.

ZURICH (zö'rik), a N. canton of Switzerland; drained by the Rhine and its tributaries, and traversed from N. W. to S. E. by ridges of lofty hills, between which lie three valleys, forming almost its whole surface—those of the Toss, the Glatt, and the Limmat. The last drains the beautiful Lake of Zurich, which, lying 1,341 feet above sea-level, is 25 miles long, and 2½ miles broad at the widest. Zurich has an area of 666 square miles and a pop. of about 425,000. Zurich has not a fertile soil, but it is carefully cultivated. Zurich was one of the earliest seats of the cotton manufacture in Europe, and the spinning and weaving of cotton are still prosecuted with great success. The silk industry is nearly as important; and machinery, bells, type, paper, etc., are also manufactured.

ZURICH, capital of the canton of Zurich; 41 miles N. N. E. of Lucerne and 43 N. W. of Glarus at the point where the Limmat issues from the Lake of Zurich and unites with its tributary the Sihl. It is one of the most prosperous manufacturing and commercial towns of Switzerland; yet the narrow streets and lofty houses of its older quarters, on the high ground E. of the river, give it the quaint appearance of a mediæval city. Of the Romanesque cathedral, erected in the 11th and 13th centuries, Zwingli was pastor, as Lavater was of the Peterskirche. The Polytechnic (1864) houses the university, founded in 1832. Fuseli was a native. Pop. with suburbs, about 160,000.

ZURICH, LAKE OF, or ZURICHERSEE, a sheet of water chiefly in the canton of Zurich, but partly in Schwyz. Its greatest length is about 27 miles; while its greatest breadth does not exceed 3 miles, and its greatest depth 600 feet. Its scenery is distinguished not so much for grandeur as for beauty. A considerable traffic is carried on on the lake by means of sailing vessels and a number of steamers. It is well supplied with fish. Its chief feeder is the Linth canal, communicating with the Wallenstattersee. It discharges itself at the town of Zürich by the Limmat.

ZURICH, TREATY OF, a convention signed in Zurich Nov. 10, 1859, by the plenipotentiaries of France and Austria, which embodied the conditions of the preliminaries of peace agreed to at Villafranca, on the part of Napoleon II. and the Emperor of Austria, Francis Joseph, and closed the Franco-Italian war by Austria's abandonment of her right to Lombardy.

ZÜTPHEN (züt'fen), a town in the Dutch province of Guelderland; on the Yssel, here joined by the Berkel; 18 miles N. N. E. of Arnhem. Of buildings the chief are the Great Church (1103; restored 1857) and the "Wijn Huis" tower. At Rysselt, 3 miles N., is the boys' reformatory of "Nederlandsch Mettray" (1851). Zütpen has manufactures of paper, oil, leather, etc. It has been several times besieged; and in a skirmish on the field of Warnsfield, a little to the E., SIR PHILIP SIDNEY (*q. v.*) received his death wound from a Spanish bullet, Oct. 2, 1586. Pop., commune, about 20,000.

ZVENIGORODKA, a town of European Russia, in the province of Kiev; on the Tikitch river; 96 miles S. S. E. of the town of Kiev; has numerous sulphur springs in its neighborhood.

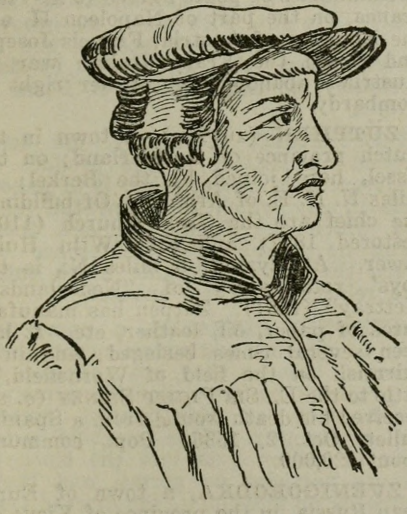
ZVORNIK, a town in Bosnia, Jugoslavia, on the Drina; 68 miles N. E. of Serajevo. The inhabitants are partly Serbian, partly Catholic and to some extent Mohammedan. The coal and lead mines are rich though undeveloped. Zvornik, which is a fortress of great strength, was occupied by the Russians, Sept. 27, 1878.

ZWICKAU (tsvik'ou), a picturesque city of Saxony; irregularly built in its older portions, in a pleasant valley on

the left bank of the Mulde; 82 miles S. W. of Dresden. Of its churches the most noteworthy is the Gothic Marienkirche, which dates from 1451, was restored in 1839-1842, and has a tower 285 feet high. The old castle has been converted into a prison. The town carries on many manufactures; but the chief source of its wealth is the rich beds of coal in the surrounding district, which employ 8,000 miners. Pop. (1896) 50,391. For the Prophets of Zwickau, see ANABAPTISTS.

ZWINGER, THEODORE, THE ELDER (tsving'er) (Latin ZWINGERUS, zwin-jē'rus), a famous Swiss physician and scholar; born in Basel, Switzerland, in 1533; became Professor of Greek at Basel in 1565. He wrote: "Theater of Human Life" (1565), a collection of anecdotes, etc. He died in Basel, in 1588.

ZWINGLI (tsving'lē), or **ZUINGLIUS** (zwing'gli-us), **ULRIC**, a Swiss reformer born in the hamlet of Wildhaus, in the Toggenburg, Jan. 1, 1484.



ULRIC ZWINGLI

After receiving instruction from his uncle the parish priest of Wessen, he was sent to study first at Basel, then at Berne, and afterward at Vienna. At the age of 18 he returned to his native village, but only to quit it again almost immediately, and renew his studies at Basel. He applied himself to scholastic theology, but gave it up in disgust as a mere waste of time, and soon after rejoiced to hear the teachings of Thomas Wittenbach. Zwingli eagerly studied the classics, and became one of the best scholars of his time. He was also passionately fond of music, and learned to play well on the flute, the lute, the violin, and other instruments. In 1506 he was ordained priest—he had been master of arts for several years—and accepted the place of pastor of Glarus, which he filled with zeal and devotedness for 10 years. During this period thoughts were working in his mind, which were the germs of the reformation to come. He twice accompanied the Swiss auxiliaries to the wars in Italy, fought at the battle of Marignano; and used his influence with his countrymen to dissuade them from foreign military service. In 1514 he had visited Erasmus at Basel, and was greatly influenced by his writings.

The year of 1516 Zwingli has noted as the period of the commencement of the Swiss Reformation. That same year he removed to the secluded monastery of Einsiedeln, of which he was appointed priest and preacher. His clear and eloquent announcement of scriptural truth astonished his new hearers, and drew crowds from the surrounding country to hear him. In 1519, through his high reputation for learning, piety and eloquence, and the active influence of his friend Oswald Myconius, Zwingli was appointed preacher at the cathedral of Zurich, and was thus brought into the center of the political movement of Switzerland. His preaching produced immense excitement by its novelty; but while most were charmed, not a few were alarmed and angry. In the autumn of the same year he was attacked by the plague (known then as the "great death"), and it was reported that he was dead. He, however, recovered, and with a new vigor and devotedness, and fullness, resumed his work. In 1522 began the action of the court of Rome against the Reformation in Switzerland; the Bishop of Constance, by letter to the chapter of Zurich, attempted to stop the preaching of Zwingli. The latter replied in his "Architeles," and the attempt failed. But an order of the Diet was soon after obtained, which prohibited preaching against the monks. About the same time Zwingli married Anna Reinhold, a widow, and mother of Zwingli's beloved disciple and friend, Gerold. He did not make his marriage known till two years later.

Meanwhile enmity was growing into persecution, and the reformer was sometimes overwhelmed with the forebodings of evil to come, and the failure of his hopes. Early in 1523 a conference between the advocates and opponents of the new doctrines was held at Zurich, by order of the Great Council; but the dis-

cussions, which lasted three days, left the controversy as it was; the reformers arguing on the basis of Scripture, and their opponents from the canon law, and there being no first principles in common with them. Not long after the reformation was publicly established in Zurich, pictures and statues, etc., were taken out of the churches, and instead of the mass a simple form of celebrating the Lord's Supper was adopted. Education was provided for, and convents were suppressed, just regard being had to the interests of their inmates. In 1528 Zwingli attended the important conferences of Baden, and in 1529 that of Marburg, where he agreed on certain articles of faith with Luther and Melanchthon. Two years later, the long suppressed enmity of the cantons which remained Catholic broke out in open war against Zurich and Berne. Delay, indecision, and half-heartedness among the citizens of Zurich made their cause hopeless; and at the battle of Cappel their handful of disorderly troops was easily destroyed or dispersed by the superior numbers and discipline of the Catholic army. Zwingli fell on that field, Oct. 11, 1531. His body was discovered, burnt, quartered, and his ashes mingled with those of swine, and scattered to the winds. The works of Zwingli were published in 1581, three volumes, 4to.

ZWOLLE, the capital of the Dutch province of Overyssel on the Zwarte Water; 25 miles N. of Zütphen; was once a strong fortress with 11 bastions and three forts. It is a handsome, well-built city, with three fine suburbs. Its corn market is one of the best in Holland. Its chief buildings are St. Michael's Church, a large and splendid building with a famous organ, the government buildings with the provincial archives, the town hall, and the courts of justice. The town has a Latin school, a school of navigation, an industrial school, a public library with rare books on geography and local history, a museum of natural history, a theater, etc. Zwolle has communication with the sea by means of the Willemsvaart canal. It manufactures oil, spirits, iron goods, and linens, carries on shipbuilding, and a trade in corn and cattle. In a monastery in the neighborhood Thomas à Kempis lived and died. Zwolle was a member of the Hanseatic League. Pop. about 35,000.

ZYGOPHYLLACEÆ, a natural order of polypetalous dicotyledons, consisting of 17 genera and upward of 100 species of shrubs or herbs with more or less jointed stems, flowers on auxiliary peduncles, and generally white, red or yellow, sepals and petals mostly five, and a dry fruit often separating into cocci. The species are widely dispersed over the tropical and sub-tropical zones, a few also occurring in temperate climates. In the type genus *Zygophyllum*, the leaves are opposite and consist of two leaflets (Greek *zugan*, "a yoke," and *phyllon*, "a leaf"). *Z. fabago* has vermifuge properties and its flower buds serve as a substitute for capers. *Z. coccineum* has aromatic seeds employed by the Arabs in place of pepper. The wood called lignum vitæ is the most important product of the order.

ZYGOSAURUS, in palæontology, a genus of *Labyrinthodontia*. Skull irregular, with concave sides, an obtuse snout, and a concave occipital border; it is lofty in the occipital region, while falling gradually in front and rapidly on the sides. Orbits slightly posterior, large, irregular. Premaxillary teeth two or more on each side, larger than the maxillary teeth, which are 16 or 18 on each side; all are conical, strong, and nearly straight, with about 20 grooves at the base. Known species one *Z. lucius*, from the Zechstein (Middle Permian), of the province of Perm in Russia.

ZYGOSPORE, in botany, the term applied by Huxley to the product of conjugation of spores when it is impossible to say which represent the male and which the female element, there being no morphological difference between the modified hyphle which enter into relation with one another.

ZYMOTIC DISEASES, a name applied to epidemic and endemic contagious diseases, because they are supposed to be produced by some morbific principle which acts on the human system like a ferment. This morbific principle or poison gets into the blood in minute particles or germs, and there increases or multiplies, the disease lasting till the poison has become forked out, or has been destroyed. The chief of these diseases are measles, scarlet fever, smallpox, typhus, typhiod, diphtheria, whooping cough, croup and erysipelas.

ZYRIANOVSK, a mining town in a rich silver-producing district of Semipalatinsk, near the S. frontier of Siberia, among the slopes of the Altai Mountains, on a head stream of the Irtish. The Zyrians of the neighborhood, a tribe of the Altai Tartars, are Shamanists, and live by hunting in the forests.

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